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NOTE N-795

TRAJECTORY DATA FOR A SINGLE-STAGE BALLISTIC MISSILE

V.J. Berinati E.T. Williams

July 197.

INSTITUTE FOR DEFENSE ANALYSES SCIENCE AND TECHNOLOGY DIVISION

Contract DAHCI5 67 C 0011 Task T-68

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A. SCOPE

This note presents numerical metric data on specific theoretical trajectories for a single-stage ballistic missile. The missile and the trajectory concepts are described in Reference 1. The contents of the present paper are of interest to only a limited clientele and so were not incorporated in Reference 1.

B. TRIJECTORY DESIGNATION

Thirty-one trajectories are presented in Tables 1 through 31. They represent about one-half of the trajectories mentioned in Reference 1 and were selected for this paper because of their final importance. The nomenclature for trajectory designation is the same as that used in Reference 1. The trajectory T2N.10 is presented for use as one of the T3N family; it may be considered to be T3N.10(125.4).

C. COMPUTATIONAL PROCEDURE

Trajectory computations were performed on a spherical nonrotating earth using the RANGE program, Reference 2, with the following computational intervals:

| From launch to 2.0 sec | 0.2 sec |
|--|---------|
| From 2.0 sec to near impact | 2.0 sec |
| From up to 2.9 sec before impact to impact | 0.2 sec |

For each trajectory derived in the above manner the following data are presented:

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Time from launch, sec Range from launch, nmi Altitude, nmi Velocity, ft/sec

Flight path-angle, deg from local horizontal (positive up)

Data are presented every 2.0 sec from launch to burnout and at all altitudes below 50 nmi; every 10 sec at altitudes above burnout on ascent or above 50 nmi. Data are also presented at burnout and at impact.

The trajectories for Reference 1 and this paper utilize the same input conditions. However, Reference 1 used a Kepler for the exoatmospheric segment and the trajectories of this paper are derived from a complete step-by-step integration. A slight difference is noted in the results. At impact ranges above 800 nmi, the ranges and flight times in this paper are slightly smaller, the difference being less than 0.5 nmi and 0.5 sec.

D. TAPED DATA

The trajectory data for Tables 1 through 31 are copied on magnetic tape number No. 1061 which is the IDA 6400 computer facility. This tape is a character-coded (BCD) tape written at 200 bpi. Each trajectory is separated by an "end-of-file."

REFERENCES

- 1. V. Berinati, R. Finke, D. Vaughan, "Performance Limits of Single-Stage Ballistic Missiles at Ranges Below Maximum (U)," IDA Paper P-708, May 1971 (S).
- 2. R.G. Finke, "The RANGE Computer Code A Multipurpose Trajectory Calculation," IDA Memorandum, 27 August 1963.

TABLE 1. TRAJECTORY SD4.80

| TIME | DANCE | | | |
|----------------------------|--------------------|------------------|--|--|
| FROM | RANGE | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| 0.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | C•00Ô | 0.000 | 90.000 |
| 4 000 | 0.000 | .064 | 35,900 | 90.000 |
| 4.000 6.000 | 0.000 | .024 | 85,000 | 90 000 |
| 8 000 | 0.000 | ,061 | 85,000 135,800 | 90 000 |
| 8,000 | 0.000 | .114 | 192,300 | 90,000 90,000 84,128 |
| 10.000 12.000 | .005 | 185 | 243 000 | 84 128 |
| 14 000 | .015 | 273 | 277_060 | 82 [*] 554 80 [*] 949 |
| 14.000 16.000 | .031 | .380 | 358,900 | 80 949 |
| 18 000 | .053 | .507 | 420,400 | 79 320 |
| 20 000 | .082 | 653 | 484 000 | 77,106 |
| 18.000 20.000 22.000 | .121 | 818 | 550,600 | 76,691 |
| 24.000 | .170 | 1.004 | 619,300 | 74,494 |
| 26.000 | •230 | 1.211 | 691.000 | 72.914 |
| 28 • 000 | •304 | 1 • 439 | 765.6 ₀₀ | 71.363 |
| 30.000 | •392 | 1:689 | 843•30C | 69.843 |
| 32.000 | •496 | 1.961 | 924 • 000 | 68.357 |
| 34 • 000 | •617 | 2.54 | 1005-600 | 66.904 |
| 36 • 000 | •756 | 2.569 | 1089.200 | 65•488 |
| 38•000 | •914 | 2.907 | 1174-500 | 64-106 |
| 38 • 000 40 • 000 | 1.093 | 3.562 | 1262-100 | 62 • 758 |
| 42,000 | 1 • 295 1 • 519 | 3 3 6 4 5 | 1750.400 | 61 • 444 |
| 44,000 | 1.768 | 4.047 | 1447 100 1544 900 1647 300 | 60,166 |
| 46.000 | 2.044 | 4,472 | 1544,900 | 58,922 |
| 48.000 | 2.347 | 4.918 | 1647.300 | 57.717 |
| 50.000 | 2.941 | 5•389 | 1754.500 | 56.548 |
| 52.000 | 3.044 | 5+882 | 1866.800 | 55.418 |
| 54.000 | 3.441 | 6.401 | 1984.500 | 54.326 |
| 56.000 | 3.873 | 6.944 | 2108.400 | 53.272 |
| 58.000 | 4.341 | 7•513 | 2238.500 | 52.256 |
| 60-000 | 4.849 | 8•110 8•734 | 2375.200 | 51.279 |
| 62.000 | 5.397 | 8•734 9•386 | 2518.800 | 50.339 |
| 64.000 | 5.989 | - | 2669.400 | 49.437 |
| 66.000 | 6.625 | 10•069 10•782 | 2827.400 | 48.572 |
| 68.000 | 7.309 | 11.528 | 2992.800 | 47.742 |
| 70.000 | 8:043 | 12.306 | 3165.900 | 46.947 |
| 72.000 | 8.829 | 13.118 | 3347.100 | 46.186 |
| 74.000 | 9.670 | 13.965 | 3536.400 | 45.457 |
| 76.000 | 10.567 | 14.849 | 3734.200 | 44.761 |
| 78 • 000 | 11.524 | 15.771 | 3940.7 ₀₀ 4156.3 ₀₀ | 44.095 |
| 80.000 | 12.543 | 16.732 | 4381 • 300 | 43.459 |
| 82.000 | 13.627 | 17.733 | 4616.000 | 42.852 |
| 84.000 | 14.779 | 18.776 | 4860.800 | 42.272 |
| | - | 7 7 0 | 400-4044 | 41.719 |

TABLE 1. (CONT'D)

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: 1

| | | , | 2) | |
|------------------------|-----------|----------------------------|------------------------------------|---------|
| TIME | RANGE | | | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | 44 200 - | _ | DATU |
| (SEC) | (NMI) | ALTITUDE | | PATH |
| 86.000 | | (NMI) | (FT/SEC) | ANGLE |
| 88,000 | 16.001 | 19.863 | 5116.300 | (DEG) |
| 90 000 | 17,297 | 20,995 | | 41.191 |
| 90.000 92.000 | 18,669 | 22,174 | 5661 100 | 40,688 |
| 94.000 | 20.122 | 23.402 | 5952,600 | 40,209 |
| 96.000 | 21 • 658 | 24 • 681 | | 39.753 |
| 98.000 | 23 • 281 | 26.012 | | 39.319 |
| 100.000 | 24.995 | 27.399 | 6907.300 | 38.906 |
| 102.000 | 26.805 | 28 . 845 | | 38.514 |
| 104.000 | 28.715 | 30.351 | 7256.400 | 38.143 |
| 106.000 | 30.729 | 31.921 | 7622.500 | 37.790 |
| 108.000 | 32.853 | 33:558 | 8008-100 | 37.457 |
| 110.050 | 35 • 093 | 35.267 | 8414-100 | 37.142 |
| 110.000 | 37.454 | 37.050 | 8842.600 | 36.844 |
| 112.000 | 39.943 | 38.914 | 9296.000 | 36.564 |
| 114.000 | 42.569 | 40.863 | 9777-100 | 36.301 |
| 116.000 | 45.340 | 42.902 | 10288.900 | 36.055 |
| 118.000 | 48.264 | 45.040 | 10835.200 | 35.825 |
| 120.000 | 51.459 | 47.283 | 11420.600 | 35.612 |
| 122.000 | 54.739 | 49.640 | 12050.500 | 35.414 |
| 124-000 | 58.213 | 52.122 | 12731.800 | 35.233 |
| BURN-OUT | AF 674.5 | | 13472.800 | 35.067 |
| - 0.111-001 | OF STAGE | 1 AT | | |
| 125.400 | 60 700 | | | |
| | 60.753 | 53,929 | 13766.500 | 34 000 |
| | | | | 34,959 |
| 126.000 | (1 0== | | | |
| 136,000 | 61.850 | 54.708 | 13755,683 | 34 455 |
| 146.000 | 80,058 | 67,458 | 13579 669 | 34.912 |
| 156.000 | 96,135 | 67,458 79,796 91,725 | 13408 300 | 34,144 |
| 166.000 | 116,089 | 91.725 | 13241 725 | 33, 356 |
| 176.000 | 133.924 | 103.247 | 13079.900 | 32,550 |
| 186.000 | 151 • 645 | 114.365 | | 31.724 |
| 186.000 | 167.259 | 125.080 | 12922.750 | 30.881 |
| 196.000 | 186.768 | 135.395 | 12770.500 | 30.018 |
| 206.000 | 204 • 179 | 145.312 | 12623.000 | 29.137 |
| 216.000 | 221.496 | 154.832 | 12480.500 | 28.238 |
| 226.000 | 238.724 | 163.958 | 12342.750 | 27.319 |
| 236.000 | 255.866 | 172.691 | 12210.000 | 26.382 |
| 246.000 | 272.928 | 181.033 | 12082-250 | 25.426 |
| 256.000 | 289.913 | 188.987 | 11959.500 11841.856 | 24.452 |
| 266.000 | 306.825 | 196.551 | 11729.244 | 23.460 |
| 276.000 | 323.669 | 203+730 | 11729.300 | 22.449 |
| 286.000 | 340.450 | 210.523 | 11621.931 | 21.421 |
| 296.000 | 357 • 169 | 216.933 | 11519.8 ₀₀ 11422.956 | 20.376 |
| 306 • 000 316 • 000 | 373.832 | 222.960 | 11331.6. | 19.314 |
| 316.000 | 390.442 | 228 • 605 | 11331+5 ₀₀ 11245+387 | 18.236 |
| | | | 116494301 | 17-142 |

TABLE 1. (CONT'D)

| TIME | RANGE | | | |
|---|---|-------------------------------|---|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 326.000 | 407.002 | 233.870 | 11164.700 | (DEG) 16.033 |
| 336.000 | 423,517 | 238,756 | 11089 587 | 14,909 |
| 346.000 | 439.990 | 243.262 | 11019.900 | 13.773 |
| 356.000 | 456.424 | 247.391 | 10955.919 | • |
| 366.000 376.000 | 472.823 489,191 | | 10897.600 | 12.623 |
| 376,000 | | 251 • 143 254 • 518 | 10844 894 | 11.461 10.288 |
| 386,000 | 505,530 | 257,518 | 10797 900 | 9,105 |
| 396.000 | 521.845 | 260.143 | 10756,719 | 7.913 |
| 406-000 | 538•138 | 262 • 393 | 10721-400 | |
| 416-000 | 554•413 | 264.268 | 10691.787 | 6./13 |
| 426-000 | 570-673 | 265.770 | 10668-100 | 5.506 |
| 436.000 | 586.922 | 266.898 | 10650-275 | 4.294 |
| 446.000 | 603-162 | 267-651 | 10638.400 | 3.077 |
| 456-000 | 619.398 | 268 • 032 | 10632.369 | 1.857 |
| 466.000 | 635•632 | 268 • 040 | 10632•200 | •636 |
| 476-000 | 651 • 867 | 267.674 | 10638.019 | 587 |
| 486.000 | 568-107 | 266.934 | 10649.700 | -1.808 -3.029 |
| 496,000 | 684,355 | 265,822 | 10667,294 | -4.245 |
| 506 000 516 000 526 000 536 000 546 000 | 700.615 | 264,335 | 10690 800 | -5 458 |
| 210,000 | 716 889 | 262,475 | 10720 062 | _6 665 |
| 526,000 | 733,182 | 262 475 260 240 257 630 | 10720 062 10755 200 10796 162 | .7.865 |
| 546 000 | /47,495 | 257,630 | 10796 162 | .9 058 |
| 556,000 | 100 046 | 254,645 | 10842 900 | _10.241 |
| 566 000 | 785.500 | 251 285 | 10895 363 | _11,414 |
| 576,000 | 790,598 | 247 548 | 10953 500 | 12 577 |
| 586 000 | 815,031 | 243,434 | 11017*312 | 13.727 |
| 596.000 | 782 200 798 598 815 031 831 502 848 015 | 238 942 | 11086 700 | -14 005 |
| | 040.012 | 234.072 | 11161.612 | 15.989 |
| 606.000 | 864.574 | 228+822 | 11242 • 100 | -17.098 |
| 616.000 | 881 • 181 | 2230192 | 11327.950 | -18.193 |
| 626.000 | 897.842 | 217-180 | 11419.200 | -19-272 |
| 636.000 | 914.559 | 210.786 | 11515.AEA | -20.334 |
| 646.000 656.000 | 931 • 337 | 204.008 | 11617.800 | -21.380 |
| 666 000 | 948,179 | 196,844 | 11724,931 | -22.408 |
| 666,000 | 965,088 | 189,295 | 11837 300 | _23_420 |
| 676.000 686.000 | 982.070 | 181,357 | 11954 681 | -24,413 |
| 696-000 | 999.129 | 173.031 | 11617.800 11724.931 11637.300 11954.681 12077.300 | -25.388 |
| 696.000 | 1016.267 | 164.313 | 12204.855 | -26.344 |
| 706.000 | 1033-492 | 155 • 203 | 12337.400 | -27.282 |
| 716.000 | 1050-805 | 145.699 | 12474.875 | -28.201 |
| 726-000 | 1068-212 | 135.798 | 12617.300 | -29.102 |
| 736.000 | 1085.718 | 125•498 | 12764.544 | -29.984 |
| 746.000 | 1103.327 | 114.800 | 12915.600 | -30.847 |
| | | | | 19 |

TABLE 1. (COMT'D)

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| TIME | RANGE | | | |
|--------------------|------------|--------------------------------------|------------------------|--------------------|
| FROM | FROM | | | _ |
| LAUNCH | LAUNCH | ALTITUDE | VEL CATEV | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 756-000 | 1121.044 | | (FT/SEC) | (DEG) |
| 766,000 | 1138,874 | 103.698 | 13073.525 | -31.691 |
| 776 000 | 1156 823 | 92,192 | 13235,200 | -32.517 |
| 786°000 | 1174 896 | 80,279 | 13401 569 | _33 324 |
| 786 000 796 000 | 11/4,090 | 67 957 55 223 42 075 39 394 | 13572 800 | _33 324 _34 113 |
| 806 000 | 1193 098 | 55,223 | 13748 713 | _34 883 _35 636 |
| 806 000 808 000 | 1211,435 | 42.075 | 13928 500 | -35 636 |
| 810-000 | 1215.120 | 39.394 | 13967,675 | -35,/84 |
| 810.000 | 1218.808 | 36.699 | 13999.300 | -35.932 |
| 812.883 | 1222•596 | 33.984 | 14042.412 | |
| 814.000 | 1556.501 | 31 • 259 | 14042•412 14063•900 | *36 • 079 |
| 816,000 | 1229,914 | 28,507 - | 14120,167 | *36 • 225 |
| 818,000 | 1233,608 | 25,759 | 14106 300 | -36.370 |
| 820.000 | 1237.310 | 22.991 | 14106 300 14103 100 | -36 ,517 |
| 822.000 | 1241.002 | 20.219 | 14056.700 | -36.662 |
| 824.000 | 1244.668 | 17.453 | 13015.100 | -36.808 |
| 826.000 | 1248 • 268 | 14.725 | 13915-100 | -36.955 |
| 828,000 | 1251,728 | 12.089 | 13569.200 12839.300 | -37-107 |
| 830.000 | 1254.917 | 9.647 | | -37,270 |
| 832.000 | 1257 • 668 | | 11503.800 | _37.455 |
| 834.000 | 1259 • 856 | 7•526 | 9551.500 | -37.685 |
| 836,000 | 1261.481 | 5+824 | 7306.400 | -37.995 |
| 838,000 | 1262,661 | 4.545 | 5356.900 | -38,431 |
| 840.000 | 1263.523 | 3,598 | 3924,400 | -39.040 |
| 842-000 | 1264 • 163 | 2.889 | 2924.300 | _39,869 |
| 844.000 | | 2.344 | 2223-600 | -40.963 |
| 846.000 | 1264.646 | 1.915 | 1735.100 | -42.362 |
| 848.000 | 1265 • 019 | 1.565 | 1395.600 | -44.089 |
| 850.000 | 1265 • 314 | 1 • 269 | 1162.900 | -46.136 |
| 853-000 | 1265 • 558 | 1.006 | 1032.700 | -48.427 |
| 852-000 | 1265.769 | • 757 | 961.400 | -50.826 |
| 854.000 | 1265.959 | •513 | 918.900 | -53.239 |
| 856-600 | 1266 • 133 | •271 | 892.300 | - 55•606 |
| 858-000 | 1266.292 | •028 | 873.300 | - 57.893 |
| 858.233 | 1266•309 | 0.000 | 871.200 | |
| | | | 2.145.4 | - 58•154 |

TABLE 2. TRAJECTORY SD6.0°

| TIME | RANGE | | | |
|------------------|-----------------------|----------------|-----------------------|----------------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (RMI) | (NMI) | (FT/SEC) | (086) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2,000 | 0.000 | .004: | 35,900 | 90.000 |
| 4.500 | 0.000 | .024 | 85.000 | 90.000 |
| 6.000 | C-000 | •061 | 135.800 | 90.000 |
| 8-000 | 0.000 | •114 | 188.300 | 90.000 |
| 10.000 | •006 | •184 | 243-100 | 82.661 |
| 12-000 | •019 | •273 | 300·100 | 80.699 |
| 14.000 | •038 | •380 | 359.600 | 78-101 |
| 16-000 | •066 | •505 | 421-600 | 76-691 |
| 18.000 | •103 | •650 | 485.900 | 74.682 |
| 22•900 20•000 | •151 | *814 000 | 553-400 | 72-699 |
| 24.000 | •212 •2 9 7 | .998 | 623.300 | 70.727 |
| 26.000 | •287 •378 | 1.201 | 696-300 | 68.792 |
| 28-000 | ·487 | 1•425 1•669 | 772-400 | 66.901 |
| 39.000 | •615 | 1.933 | 851 •800 934 • 500 | 65-055 |
| 32.000 | •764 | 2.518 | 1017-900 | 63.259 |
| 34 * 000 | •935 | 2.522 | 1103-800 | 59•812 61•510 |
| 36•000 | 1.129 | 2.846 | 1191-300 | 58 • 164 |
| 38•000 | 1 • 349 | 3.189 | 1281-400 | 56.562 |
| 40•300 | 1 • 594 | 3.550 | 1374-500 | 55.007 |
| 42.000 | 1.867 | 3.930 | 1471.800 | 53.501 |
| 44.000 | 2.170 | 4,329 | 1572,400 1677,800 | 52,043 |
| 46,000 | 2,504 | 4,746 | 1677,800 | 50 634 49 275 47 964 |
| 48,000 | 2.870 | 5,189 | 1787,900 | 49,275 |
| 50,000 | 3.271 | 5,638 | 1903,100 | 47,964 |
| 52,000 54,000 | 3,708 4,183 | 6,113 | 2023 800 2150 000 | 46 703 45 489 44 324 |
| 54.000 56.000 | 4,699 | 6,608 7 123 | 2150,000 | 45,489 |
| 58.000 | 5.257 | 7,123 7,658 | 2283 200 2422 500 | 44,324 |
| 60.000 | 5.859 | 8.215 | 2568.800 | 43.206 |
| 62.000 | 6.508 | 8,793 | 2722•300 | 42.134 |
| 64.000 | 7.206 | 9.393 | 2883.100 | 41•108 40•126 |
| 66.000 | 7•955 | 10.016 | 3051.400 | 39.186 |
| 68.000 | 8•758 | 10.663 | 3227.500 | 38.289 |
| 70.000 | 9.618 | 11•333 | 3411.700 | 37.431 |
| 72.000 | 10.536 | 12.028 | 3604.300 | 36.613 |
| 74.000 | 11.515 | 12.749 | 3805.500 | 35.832 |
| 76-000 | 12.558 | 13•495 | 4015-700 | 35.087 |
| 78.000 | 13.668 | 14.268 | 4235 • 100 | 34+376 |
| 80.000 | 14.848 | 15.069 | 4464.200 | 33.699 |
| 82.000 | 16.101 | 15.899 | 4703.300 | 33.054 |
| 84 • 0 0 0 | 17•429 | 16.759 | 4952.800 | 32•440 |

Service of the servic

TABLE 2. (CONT'D)

| | YA | ele 2. (com | रकार | |
|---|--------------------------|---|------------------------------|----------------------------|
| TIME | RANGE | , | · •, | |
| FROM | | | | |
| | FROM | | | • • • |
| LAUNCH | LAUNCH | ALTITUDE | VEL OATEN | PATH |
| (SEC) | (MMI) | (MMI) | | AYSLE |
| 86.000 | 18-837 | | (FT/SEC) | (066) |
| 88,000 | 26 32 | 17.549 | 5213,30¢ | 31 |
| 90.000 | 29,326 | 18,570 | 5485,200 | 31.855 |
| | 21.902 | 19.525 | 5769.200 | 31,299 |
| 92.000 | 23.567 | | | 30.769 |
| 94.000 | 25.325 | 20.514 | 6 065.8 ₀₀ | 30.266 |
| 96.000 | 27 181 | 21.538 | 6375 . 900 | 29 • 189 |
| 98,000 | 27.181 | 22,599 | 6701,700 | |
| 100 000 | 29,139 | 23,700 24,841 | 7041 100 | 29,335 |
| 100,000 | 31,203 | 24 841 | 7207 900 | 28,905 |
| 105.000 | 33,380 | 26 024 | 7397 800 | 28,498 |
| 104 000 106 000 108 000 110 000 112 000 | 35,672 | 26,024 | 7771 900 | 28,112 |
| 106,000 | 28 000 | 27,252 | 8165 100 | 27 /40 |
| 108 000 | 38,088 | 28 528 29 853 | 8579 000 | 27 /48 |
| 116 000 | 40,632 | 29 853 | 9015 600 | 27,404 |
| 110,000 | 43,312 | 31 230 | 9013 000 | 21_080 |
| 115.000 | 46,136 | 31,230 | 9477 200 | 26,775 |
| 117,000 | 49,111 | 32,664 | 9966 600 | 26,489 |
| 116 ann | 52 364 | 34,158 35,716 37,343 | 10486 800 | 26 222 |
| 118 000 | 52,356 | 35,716 | 11041 700 | 26, 222 |
| 120,000 | 55,679 | 37,343 | 11635 700 | 25, 473 |
| 116 000 118 000 120 000 122 000 124 000 | 59,186 | 30 045 | 11033 100 | 25,741 |
| 155,000 | 62,893 | 39,045 | 12274 300 | 25,527 |
| 124 000 | 66 816 | 40,828 | 12964 400 | 25 331 |
| • • • • | 66,815 | 42,699 | 13714 300 | 25 152 |
| RUPNEOUT | of 654 | • | • | 25,152 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 100 | | • | | |
| 125.400 | 69.683 | 44 450 | | |
| | | 44.059 | 14014.200 | 25.036 |
| | | | | |
| 126 000 | | | | |
| 126.000 | 70.921 | 44.644 | 14004 200 | _ |
| 128.000 | 75.044 | | 14006.200 | 24.987 |
| 130,000 | 79,162 | 46,583 | 13979,600 | 24,823 |
| 132,000 | 17,102 | 48,507 | 13953 300 | |
| 142 000 | 83,276 | 50,416 | 13927 200 | 24,658 |
| 142.000 | 103,778 | 50,416 59,724 | 13700 000 | 24,493 |
| 152,000 | 124,175 | 68 643 | 13799 900 | 23,658 |
| 162.000 | 144,470 | 68,643 | 13011,000 | 22,809 |
| 172.000 182.000 | 164 640 | 77,177 85,325 | 13560 100 | 21,946 |
| 182 000 | 164,669 | 85,325 | 13447 575 | 21 070 |
| 192 000 | 184,777 | 93 090 | 13339 900 | 21,070 |
| 192.000 | ~ 0 4 _800 | 100 473 | 13237 106 | 20 181 19 278 18 363 |
| EUZ,000 | 224,741 | 107 476 | 13237 106 | 19,278 |
| 212,000 | 244 606 | 114 -00 | 13139 300 | 18 363 |
| 202.000 212.000 222.000 | 244 606 264 399 | 100 473 107 476 114 099 120 344 126 212 | 13046 450 | 19,278 18,363 17,436 |
| 232.000 | 204 127 | 120,344 | 12958 700 | 16,497 |
| 244 | 284.125 | 126.212 | 12875.875 | 16 477 |
| 242.000 | 303.788 | 131.704 | 10708 - | 15.547 |
| 252•000 | 323 • 393 | 134.00 | 12798.200 | 14.586 |
| 262•000 | 342.944 | 136.821 | 12725.6nn | 13.614 |
| 272.000 | 360-4-4 | 141.564 | 12658.100 | 12.633 |
| 585.000 | 362-446 | 145.933 | 12595.731 | |
| 505.004 | 381.902 | 149.930 | 12538.600 | 11.642 |
| 292.000 | 401+317 | 153.556 | 15330.000 | 10.642 |
| | · · · · | 1-3-330 | 12486.650 | 9•635 |
| | | | | • • |

THE 2. (COM'D)

| | | • | -, | |
|--------------------|--|--------------------|---|---------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMT) | (1001) | (FT/SEC) | AMGLE |
| 302.000 | 420.695 | 156-810 | 12.30.004 | (DF9) |
| 312,000 | 440.039 | 159,693 | 12398 387 | 8.620 |
| 322,000 | 459, 356 | 162,206 | 12362 200 | 7,599 |
| 332,000 | 459 356 478 646 497 917 | 164,350 | 12331 231 | 6 571 5 539 |
| 342.000 | 497.917 | 166.124 | 12398 387 12362 200 12331 231 12305 600 | |
| 352.000 | 517-169 | 167.530 | 12285.237 | 4.502 |
| 362.000 | 536-410 | 168.566 | 12270-300 | 3.461 |
| 372-000 | 555-641 | 169.234 | 12260-562 | 2-419 |
| 382.000 | 574 • 886 | 169.534 | 12256.300 | 1.374 |
| 392.000 402.000 | 594-691 | 169•465 | 12257-231 | •328 •718 |
| 412.000 | 613-318 | 169.028 | 12263.600 | -1.765 |
| 422,000 | 632,552 | 168.222 | 12275,256 | -2.809 |
| 432.000 | 651,797 | 167,048 | 12275,256 12292,200 | -3,851 |
| 442,000 | 671 055 690 333 | 165,504 | 12314 581 | -4 890 |
| 452,000 | 709 422 | 163,592 | 12342 200 | -5,926 |
| 462,000 | 728 950 | 161.310 | 12375,106 | -6.956 |
| 472,000 | 748 316 | 158,659 | 12314 581 12342 200 12375 106 12413 300 12456 725 | -7.981 |
| 482,000 | 767 707 | 155,637 | 12456,725 | -9,000 |
| 492,000 | 787°137 | 152,244 | 12303 400 | -10,012 |
| 502,000 | 709 633 728 959 748 316 767 707 787 137 806 609 826 129 845 700 865 326 885 012 904 763 924 582 | 148,480 | 12559 325 | -11,017 |
| 215 000 | 826,129 | 144 344 139 834 | 12618 400 | _12_013 |
| 255.000 | 845 700 | 134,952 | 12682 675 12752 100 | -13,001 |
| 532,000 | 865 326 | 129,695 | 12826 625 | -13.4/8 |
| 542,000 | 885 012 | 124 063 | 12906 200 | -14,947 |
| 552 000 | 904 763 | 118,054 | 12990 906 | 15,903 |
| 202.000 | | 111.668 | 13080.600 | _16 850 |
| 572-000 | 944-476 | 104.903 | 13175.253 | _17.784 |
| 582.000 | 964 • 446 | 97.758 | 13274.900 | -18.7 ₀₆ |
| 592.000 | 984.500 | 90.233 | 13379,544 | -19.617 -20.514 |
| 602.000 612.000 | 1004,642 | 82,324 | 13489 100 | 21 399 |
| | 1024.876 | 74.032 | 13603,475 | 22.270 |
| 622•000 632•000 | 1045.209 | 65+355 | 13722-800 | -23. 128 |
| 642.000 | 1065-644 | 56.290 | 13846.913 | -23 •971 |
| 644,000 | 1086.187 | 46.837 | 13975,600 | -24,801 |
| 646.000 | 1090,309 | 44,899 | 14002,137 | -24.965 |
| 648.ngg | 1094.436 | 42.946 | 14027.900 | -25.129 |
| 650.200 | 1098.568 | 40.977 | 14054.931 | -25.292 |
| 652.000 | 1102.703 1106.844 | 38+993 | 14079.800 | -25.455 |
| 654.000 | 1110.044 | 36,993 | 14107,469 | -25,617 |
| 656,000 | 1110.987 1115.137 1119.285 | 34,979 | 14129,500 14157,125 | -25,179 |
| 658 000 | 1119 285 | 32,94, | 14157,125 | -25,939 |
| • • • | | 30,903 | 14172,700 | _26_100 |
| | | | | • |

TABLE 2. (CONT'E)

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T :

| TIME | DAMAE | | | |
|-------------------------------|----------------------|--|------------------|----------------|
| FROM | RANGE | | | |
| LAUNCH | FROM | | | 245 |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | PATH |
| | (NMI) | (MMI) | (FT/SEC) | ANGLE |
| 660.000 | 1123.445 | 28.839 | 1 200 - | (086) |
| 662,300 | 1127,592 | 26,771 | 1,200.967 | -56.560 |
| 664 000 | 1131 744 | 24 495 | 14198,700 | -26,420 |
| 666,000 | 1131 744 1135 889 | 24 685 22 590 | 14121, 200 | _26 580 |
| 668 000 | 1140 020 | 22,370 | 14176 300 | _26 740 |
| 670 C00 672 000 | 1144 122 | 20,488 | 14119 200 | 26 901 |
| 672°ann | 1144,123 | 18,387 | 13996 900 | 27 04. |
| 674 000 676 000 | 1148,171 | 16,301 | 13756 500 | -27 230 |
| 676 000 | 1152,118 | 14,253 | 13320 400 | -27,230 |
| 678 000 | 1155,895 | 20 488 18 387 16 301 14 253 12 280 | 12508 300 | -61_444 |
| 678 000 680 000 682 000 | 1159 399 | 10,435 | 11468 200 | +51 JAI |
| 600,000 | 1162 516 | 8,779 | 11400 200 | -27 802 |
| 000,000 | 1165 157 | 7.360 | 9974 000 | _28 052 |
| 004.000 | 1167.287 | 7,360 | 8253 100 | _28_364 |
| 686-000 | 1168-948 | 6.198 | 6537.100 | _28,767 |
| 688-000 | | 5•276 | 5074.400 | -29.299 |
| 690-000 | 1170-228 | 4.547 | 3941.500 | -29.494 |
| 692.000 | 1171-220 | 3 • 964 | 3095.500 | |
| 694.000 | 1171 • 996 | 3•490 | 2463.600 | -30.889 |
| 696 000 | 1172,609 | 3.097 | 1987.000 | -32.016 |
| 696,000 | 1173,099 | 2,763 | 1425 540 | -33,409 |
| 698.000 | 1173.497 | 2.473 | 1635,500 | 35,094 |
| 700-000 | 1173-825 | | 1372.400 | -37.080 |
| 702-000 | 1174-103 | 2.215 | 1176.000 | -39.356 |
| 704 • 000 | 1174.346 | 1.978 | 1053.900 | -41.872 |
| 706-000 | 1174.565 | 1.749 | 981.200 | -44.516 |
| 708-000 | 1174.744 | 1 • 5 2 3 | 936-100 | -47-153 |
| 710.000 | 1174.766 | 1.596 | 907-100 | ~49.639 |
| 712-000 | 1174.951 | 1.066 | 888.000 | 47.039 |
| 714.000 | 1175-123 | •833 | 875.300 | -52-414 |
| 714.000 | 1175 • 283 | •595 | 864.900 | -54.888 |
| 716-000 | 1175+431 | • 354 | 855.000 | ~5?.249 |
| 718-000 | 1175.569 | •110 | 855.000 | -59,494 |
| 718.896 | 1175.627 | 0.000 | 845.200 | -61.022 |
| | | ~ • • • • | 840 . 968 | -62°.538 |
| | | | | |

TABLE 3. TRAJECTORY SD6.4°

| TIME | RANGE | | | |
|--|--------------------------|----------------|--|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (MMI) | (MMI) | (FT/SEC) | (086) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 6.000 | .004 | 35,900 | 99.000 |
| 4,000 | 0.009 | .024 | 85,000 | 90,009 |
| 6,000 | 0.000 | .061 | 135 800 | 90,000 |
| 8,000 | 0_000 | .114 | 188 300 | 96,000 |
| 10,000 | .006 | 184 | 243 100 | 82 173 |
| 12,000 | .028 | 273 | 300,309 | 80 082 |
| 14.000 16.000 18.000 20.000 22.000 | .041 | .379 | 359,900 | 77_954 |
| 10,000 | .070 | 505 | 422 100 | 75,815 |
| 19,000 | ,110 | 649 | 486 600 | 73 681 |
| 20,000 | ,161 | .812 | 554 500 | 71,567 |
| 22,000 | .226 | 995 | 624,700 | 69,486 |
| 24,000 26,000 28,000 30,000 | 305 | 1,197 | 698 200 | 67,438 |
| 20,000 | 402 | 1,420 | 775_000 | 65,439 |
| 20.000 | 518 | 1,661 | 855 [°] 000 938 ° 500 | 63,492 |
| | .654 | 1.923 | | 01+000 |
| 32.000 | •8 ₁₂ •993 | 2.505 | 1022-500 | 59.760 |
| 34.000 | | 2.504 | 1109-200 | 57.977 |
| 36-000 | 1.199 | 2.824 | 1197.500 | 56-248 |
| 38.000 | 1.431 | 3.160 | 1288.500 | 54.571 |
| 40.000 42.000 | 1•691 1•980 | 3.514 | 1382-500 | 52.946 |
| 44-000 | 2.599 | 3•886 4•276 | 1480-800 | 51.374 |
| 46-000 | 2.651 | 4.683 | 1582-300 | 49.854 |
| 48-000 | 3•u37 | 5.107 | 1688.7 ₀₀ 1799.8 ₀₀ | 48.388 |
| 50.000 | 3.459 | 5.549 | 1916-000 | 46.974 |
| 52.000 | 3.918 | 6.009 | 2037.600 | 45•614 44•305 |
| 54.000 | 4.417 | 6.486 | 2164.500 | 43.049 |
| 56.000 | 4.958 | 6.981 | 2298.600 | 41.843 |
| 58.000 | 5.543 | 7.496 | 2438.600 | 40.687 |
| 60.000 | 6•173 | 8.028 | 2585.700 | 39.580 |
| 62.000 | 6.852 | 8.580 | 2739.900 | 38.520 |
| 64.000 | 7.581 | 9 • 152 | 2901.500 | 37.507 |
| 66.000 | 8.363 | 9.743 | 3070.500 | 36.539 |
| 68.000 | 9.200 | 10.355 | 3247.200 | 35.615 |
| 70.000 | 10.095 | 10.988 | 3432.100 | 34.733 |
| 72.000 | 11.050 | 11.643 | 3625.300 | 33.89i |
| 74.000 | 12.068 | 12.319 | 3827.200 | 33.088 |
| 76.000 | 13.152 | 13.018 | 4038.000 | 32.323 |
| 78-000 | 14.305 | 13.741 | 4258.300 | 31.593 |
| 80.000 | 15.529 | 14.487 | 4488.200 | 30.899 |
| 82.000 | 16.828 | 15.258 | 4728.200 | 30.237 |
| 84.000 | 18.204 | 16.055 | 4978.700 | 29.607 |

TABLE 3. (CONT'D)

| | | este o. (Cons | . 9) | |
|---|--|---|--|--|
| TIME | RANGE | | | |
| FROM | FROM | | | DATH |
| . | | 45 99905 | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ayble |
| (SEC) | (NMI) | { MM4 I } | (FT/SEC) | (DE6) |
| 86.000 | 14.661 | 16-878 | 5240,100 | 29.00g |
| 83.000 | 21.202 | 17,728 | \$513 100 | 28,438 |
| 90,000 | 22,832 | 18,607 | ETGR AAA | 27 406 |
| 92.000 | | 10,50 | 5513.100 5798.400 6096.400 | 27,896 |
| | 24.553 | 19.514 | 0040*+00 | 27,382 |
| 94-000 | 26•370 | 20•453 | 6488-000 | 26•893 |
| 96-000 | 26•287 | 21.423 | 6734-000 | 26.429 |
| 98.000 | 30.308 | 22.426 | 7076.900 | 25.990 |
| 100,000 | 22 A2G | 23,465 | | 25,574 |
| 102,000 | 34 683 | | 7434,500 | |
| 194 600 | 37,000 | 24,540 | 7811,000 8206,300 | 25,180 |
| 134,600 | 37,040 | 25,653 | 8200,300 | 24,808 |
| 106,000 | 39,539 | 26,807 | 8622,400 | 24,457 |
| 108,000 | 42,161 | 28,004 | 8622 400 9061 300 9525 300 10017 000 | 24,127 |
| 110,000 | 44.923 | 29 247 | 9525 300 | 23 816 |
| 112 000 | 47 832 | 30°537 | 10017 000 | 23*525 |
| 114 060 | 51 000 | 21 980 | 10529 700 | 22 353 |
| 116 000 | 54 243 | 31,000 | 10539 700 11097 000 | 23, 816 23, 525 23, 253 23, 489 |
| 110,000 | 34,243 | 33,276 | 11091,000 | 22 999 22 763 |
| 110,000 | 21,664 | 34,735 | 11693,500 | 22,763 |
| 110 000 112 000 114 000 116 000 118 000 120 000 | 36,682 37,048 39,539 42,161 44,923 47,832 51,066 54,243 57,664 61,275 | 28,004 29,247 30,537 31,880 33,278 34,736 36,258 | 11693 500 12334 700 13027 300 | 22,546 |
| 122,000 | 65,090 | 37,851 | 13027 300 | 22,346 |
| 124,000 | 69,126 | 39,521 | 13779 800 | 22,164 |
| • | • • • | | | , |
| BURN-0UT | OF STAGE | 1 AT | | |
| | 0 . 9 , 0 | • | | |
| 125,400 | 72 677 | | * · · · * * * · · · | |
| | | ¥0.733 | 3 & A & 3 & 7 A A | 22 044 |
| , | 72.077 | 40.733 | 14081.700 | 22.046 |
| , | 12.U:1 | 40.733 | 14081.700 | 22.046 |
| | | 40.733 | 14081.700 | 22.046 |
| 126.000 | 73.350 | 40.733 41.255 | 14081.700 | _ |
| | 73.350 | 41.255 | 14074.400 | 21.996 |
| 126.000 128.000 | 73.350 77.593 | 41.255 42.982 | 14074.400 14050.300 | 21.996 21.829 |
| 126.000 128.000 130.000 | 73.350 77.593 81.831 | 41.255 42.982 44.694 | 14074.400 14050.300 14026.700 | 21.996 21.829 21.662 |
| 126.000 128.000 130.000 132.000 | 73.350 77.593 81.831 86.065 | 41.255 42.982 44.694 46:391 | 14074.400 14050.300 14026.700 14003.400 | 21.996 21.829 21.662 21.494 |
| 126.000 128.000 130.000 132.000 134.000 | 73.350 77.593 81.831 86.065 90.294 | 41.255 42.982 44.694 46.391 48.072 | 14074.400 14050.300 14026.700 14003.400 13980.400 | 21.996 21.829 21.662 21.494 21.326 |
| 126.000 128.000 130.000 132.000 134.000 | 73.350 77.593 81.831 86.065 90.294 94.520 | 41.255 42.982 44.694 46.391 48.072 49.738 | 14074.400 14050.300 14026.700 14003.400 | 21.996 21.829 21.662 21.494 21.326 21.157 |
| 126.000 128.000 130.000 132.000 134.000 136.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 | 41.255 42.982 44.694 46.391 48.072 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 | 21.996 21.829 21.662 21.494 21.326 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 | 73.350 77.593 81.831 86.065 90.294 94.520 | 41.255 42.982 44.694 46.391 48.072 49.738 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 | 21.996 21.629 21.662 21.494 21.326 21.157 20.988 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 | 21.996 21.629 21.662 21.494 21.326 21.157 20.988 20.133 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 148.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 | 21.996 21.629 21.662 21.494 21.326 21.157 20.988 20.133 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 148.000 153.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 |
| 126.000 128.000 130.000 132.000 134.000 136.000 148.000 158.000 168.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 148.000 158.000 168.000 178.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 289 17.499 16.598 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 168.000 178.000 188.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 ,267 13.389 17.499 16.598 15.686 |
| 126.000 128.000 130.000 132.000 134.000 136.000 138.000 148.000 158.000 178.000 188.000 198.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 239 17.499 16.598 15.686 14.764 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 178.000 188.000 198.000 208.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 13196.800 | 21.996 21.629 21.662 21.494 21.326 21.157 20.988 20.133 .267 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 178.000 188.000 198.000 208.000 218.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 239 17.499 16.598 15.686 14.764 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 178.000 198.000 208.000 218.000 228.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 285.223 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13526.500 13436.625 13351.700 13271.744 13196.800 13126.925 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 289 17.499 16.598 15.686 14.764 13.832 12.890 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 178.000 198.000 208.000 218.000 228.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 285.223 305.604 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 114.604 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13526.500 13436.625 13351.700 13271.744 13196.800 13126.925 13062.000 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 289 17.499 16.598 15.686 14.764 13.832 12.890 11.940 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 168.000 178.000 188.000 208.000 218.000 228.000 238.000 248.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 285.223 305.604 325.934 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 114.604 118.866 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 13196.800 13126.925 13062.000 13002.250 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 ,267 13.839 17.499 16.598 15.686 14.764 13.832 12.890 11.940 10.981 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 168.000 188.000 208.000 218.000 228.000 238.000 258.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 285.223 305.604 325.934 346.218 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 114.604 118.866 122.757 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 13196.800 13126.925 13062.000 13002.250 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 .267 289 17.499 16.598 15.686 14.764 13.832 12.890 11.940 10.981 |
| 126.000 128.000 130.000 130.000 134.000 136.000 138.000 148.000 158.000 168.000 178.000 188.000 208.000 218.000 228.000 238.000 248.000 | 73.350 77.593 81.831 86.065 90.294 94.520 98.741 119.791 140.746 161.612 182.395 203.099 223.729 244.290 264.786 285.223 305.604 325.934 | 41.255 42.982 44.694 46.391 48.072 49.738 51.388 59.411 67.053 74.315 81.197 87.703 93.832 99.585 104.965 109.970 114.604 118.866 | 14074.400 14050.300 14026.700 14003.400 13980.400 13957.600 13935.100 13825.575 13721.000 13621.250 13526.500 13436.625 13351.700 13271.744 13196.800 13126.925 13062.000 13002.250 | 21.996 21.829 21.662 21.494 21.326 21.157 20.988 20.133 ,267 13.839 17.499 16.598 15.686 14.764 13.832 12.890 11.940 10.981 |

TABLE 3. (COMT'D)

| TIME | RANGE | | | |
|---|---|-----------------------------|------------------------|------------------------------------|
| FROM | _ | | | |
| LAUNCH | FROM Launch | 41 TOTUSE | | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| 278.000 | (NMI) | (MMI) | (FT/SEC) | (DEG) |
| 288,000 | 386.66 ³ 406,833 | 129.429 | 12853.400 | g.0 ₆ 1 |
| 298 000 | 400,033 | 132,211 | 12814,031 | 7,075 |
| 308 000 | 447 601 | 134,624 | 12779 900 | 6,084 |
| 318 000 | 447 105 | 136,670 | 12750 906 | 5 088 |
| 298 000 308 000 318 000 328 000 338 000 | 426 974 447 991 467 185 487 264 507 329 | 138,346 | 12727 100 | 4_089 |
| 338.000 | 507.328 | 139 656 | 12708 481 | 3 086 |
| 348-000 | 507.224 | .40.599 | 12695.100 | 2.081 |
| 358 • 000 | 527•386 54%-4 2 9 | 161-174 | 12686.881 | 1.075 |
| 368-000 | 547 • 439 | 141 • 382 | 12684.000 | •068 |
| 378.000 | 567·492 | 141.523 | 12686.256 | 940 |
| 388.000 | 587•548 607 613 | 140-697 | 12693.700 | -1.946 |
| 398 000 | 607,613 627,689 | 139,804 | 12706,375 | -2,951 |
| 398,000 408,000 | 627,689 647,781 | 138,544 | 12724.300 | -3,954 -4,954 |
| 418.000 | 667.894 | 136,916 134 . 920 | 12747 450 | -4.954 |
| 428.000 | 688.032 | | 12775.700 | -5.950 |
| 438-000 | 708-198 | 132,556 | 12809-181 | -6.942 |
| 448-000 | 728•397 | 129-824 | 12847-800 | -7.929 |
| 458-000 | 748 • 633 | 126.722 | 12891-575 | -8.910 |
| 468 • 000 | 768 • 911 | 123•251 119•410 | 12940-500 | -9.885 |
| 478-000 | 789-235 | 115•198 | 12994•525 13053•700 | -10-852 |
| 488.000 | 809-609 | 110.615 | | *11.812 |
| 498-000 | 830.037 | 105+658 | 13117.850 13187.100 | -12.764 |
| 508-000 | 850.526 | 100 • 329 | 13261.394 | -13.7 06 |
| 518-000 | 871.077 | 94.626 | 13340-700 | -14.639 |
| 528.000 | 891.698 | 88.547 | 13424.969 | - 15•563 - 16•476 |
| 538•000 | 912.391 | 82.093 | 13514.100 | -17.379 |
| 548.000 | 933•163 | 75.261 | 13608.244 | -18-270 |
| 558.000 | 954.018 | 68.050 | 13707.300 | -19.150 |
| 568.000 | 974.961 | 60.459 | 13811,250 | -20.018 |
| 578,000 | 995,997 | 52,488 | 13920 000 | _20_874 |
| 588.000 | 1017.132 | 44.133 | 13920 000 14033.300 | 21.717 |
| 590.000 | 1021.371 | 42.417 | 14055.900 | -21.884 |
| 592.000 | 1025.614 | 40 • 685 | 14079.325 | *22.051 |
| 594.000 | 1058.860 | 38.937 | 14101.100 | -22-217 |
| 596.000 | 1034.112 | 37.174 | 14124,756 | -22,383 |
| 598,000 | 1038,366 | 35,397 | 14144,500 | -22,548 |
| 600,000 | 1042,626 | 33,603 | 14167,469 | -22,713 |
| 602.000 | 1046.884 | 31.796 | 14182.900 | -22.678 |
| 604.000 | 1051 • 150 | 29.973 | 14204.133 | -23.041 |
| 606+000 | 1055.411 | 28•138 | 14209.200 | -23.206 |
| 698.000 | 1059-674 | 26.289 | 14213.300 | -23.369 |
| 610.000 | 1063.934 | 24 • 427 | 14206.300 | -23 • 533 |

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TABLE 3. (CONT'D)

| TIME | RANGE | | | |
|-------------------------------|--|-------------------------|------------------------------------|--|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | UEL DATEN | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| م00.212 | 1068-186 | | (FT/SEC) | (DEG) |
| 614,000 | 1072,423 | 22.555 | 1,180,200 | -23.697 |
| 616,000 | 1076 632 | 20,677 | 14122,000 | -23,862 |
| 618 000 | 1076 632 1080 791 | 18,797 | 14669 100 | _24_029 |
| 620,000 | 1084 865 1088 798 1092 513 1095 916 | 16,926 | 13803 000 | _24 029 _24 199 |
| 622,000 | 1088 708 | 15,079 | 13447 100 | _24,375 |
| 624 Ann | 1002,798 | 13,282 | 12872 500 | _24_562 |
| 626 000 628 000 | 1005 014 | 11,570 | 12004 000 | -24 767 |
| 628.000 | 1098.917 | 9 987 | 10807 300 | -25,002 |
| 630.000 | | 8.575 | 12004 000 10807 300 9352 300 | 25.281 |
| 632-000 | 1101-456 | 7•364 | 7770-100 | -25.627 |
| 634.000 | 1103-525 | ′ 6•361 | 6251-100 | -26.067 |
| 634 • 000 636 • 000 | 1105-168 | 5.547 | 4950-100 | - 26•632 |
| 638.000 | 1106-461 | 4•888 | 3922.500 | -27.356 |
| 640.000 | 1107.483 | 4.349 | 3136,900 | -28,269 |
| | 1108.296 | 3.901 | 2537,200 | 29.401 |
| 642-000 | 1108.950 | 3•523 | 2074.400 | -30 • 781 |
| 644.000 | 1109-479 | 3.197 | 1722.700 | |
| 646.000 | 1109,914 | 2.911 | 1455,000 | *32•435 |
| 648,000 | 1110,275 | 2,654 | 1455.000 1251.600 1103.800 | -34,373 |
| 650,000 | 1110,580 | 2,417 | 1103 800 | -36 ₋ 594 |
| 652.000 | 1110,844 | 2.192 | 1014.500 | -39,072 |
| 654.000 | 1111.081 | 1.971 | 959 600 | -41,725 |
| 656,000 658,000 660,000 | 1111,297 | 1.971 1.749 1.524 | 924,200 | -44,452 |
| 000,000 | 1111,495 | 1.524 | 900 800 | -47 ,177 |
| 000,000 | 1111,680 | 1,295 | 885 300 | _49`849 _52_435 |
| 005 000 | 1111,851 | 1.062 | 874 800 | -52,435 |
| 004_000 | 1112,011 | 824 | 866 800 | -24.415 |
| 000 000 | 1112,160 | 582 | 858 900 | _54 912 _57 269 _59 505 _61 621 |
| 998 000 | 1112,298 1112,426 | .337 | 850 900 | -24,505 |
| 670,000 | 1112,426 | .090 | 000 7UU | -01,051 |
| 670.720 | 1112.471 | 0.000 | 842 600 838 630 | -03 050 |
| | | V • U • V | 839.620 | -64.312 |

TABLE 4. TRAJECTORY SD6.80

| | | | 211 00000 | |
|--------------------------------------|------------------|------------|--|------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TITUOS | UEL OATEN | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 0.000 | 0.000 | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | | 0.000 | 0.000 | 90.000 |
| 4.000 | Ũ•000 | •004 | 35,900 | 90.000 |
| 6.000 | 0.000 | .024 | 85,000 | 90,000 |
| 6,000 | 0,600 | .061 | 135,800 | 90,000 |
| 8 000 10 860 | 0,000 | ,114 | 188_300 | 90,000 |
| 10,000 | .007 | 184 273 | 243,200 | 81 684 |
| 12,000 | .021 | .273 | 300 400 360 200 | 79,465 |
| 14.000 | .044 | 379 | 360 200 | 77 209 |
| 16,000 18,000 | .075 | 504 | 422 600 | 74 942 |
| 10.000 | ,116 | 648 | 45/40 0 | 74 942 72 684 |
| 20,000 | .171 | 810 | 555 600 | 70 450 |
| 22,000 20,000 | .239 | 992 | 626,300 | 70 450 |
| 29 8000 | 324 | 1,193 | 700 300 | 68 253 66 095 |
| 26,000 | 427 | 1,414 | 700 300 777 100 | |
| 26 000 28 000 30 000 32 000 | 549 | 1 653 | 858 400 | 63,492 |
| 30,000 | 693 | 1,912 | 942.600 | 61 947 |
| 32,000 | 860 | 2,191 | 1027 300 | 59 962 58 035 |
| 34,000 | 1,051 | 2,486 | 1114 Ann | 50,035 54,130 |
| 34 000 36 000 | 1,269 | 2,800 | 858 400 942 600 1027 300 1114 800 1204 000 | 56 172 |
| 38.000 | 1.513 | 3.130 | 1295.800 | 54 368 |
| 40.000 | 1.786 | | | 52.620 |
| 42.000 | 2.090 | 3.477 | 1390.800 | 50•929 |
| 44.000 | | 3.841 | 1490.000 | 49.295 |
| 46.000 | 2•426 | 4.551 | 1592 1600 | 47.718 |
| 48.000 | 2•795 | 4.617 | 1700-000 | 46 • 199 |
| 50.000 | 3.200 | 5.029 | 1812.000 | 44.737 |
| 52.000 | 3+541 | 5•456 | 1929.200 | 43+331 |
| 54.000 | 4.122 | 5.900 | 2051 • 500 | 41.980 |
| 56.000 | 4.644 | 6•360 | 2179.300 | 40+684 |
| 58.000 | 5.208 | 6.835 | 2314.000 | 39.442 |
| 58.000 | 5.818 | 7.328 | 2454.800 | 38.252 |
| 50.000 | 6.475 | 7.836 | 2602.500 | 37.114 |
| 62.000 | 7.182 | 8.361 | 2757.300 | 36.025 |
| 64.000 | 7.940 | 8.904 | 2919•400 | 34.985 |
| 66.000 | 8.752 | 9•463 | 3088.900 | 33.992 |
| 68.000 | 9.621 | 10.041 | 3266.100 | 33.044 |
| 70.000 | 10.548 | 10.636 | 3451.400 | 32.140 |
| 72.000 | 11.538 | 11.250 | 3645.000 | 31.278 |
| 74.000 | 12.592 | 11.882 | 3847.300 | 30.456 |
| 76.000 | 13.712 | 12.533 | 4058.600 | 29.673 |
| 78.000 | 14.903 | 13.205 | 4279-200 | 28.927 |
| 80.000 | 16.167 17.506 | 13.896 | 4509.500 | 28.216 |
| 82.000 | 17,506 | 14,609 | 4750,000 | 27.540 |
| 84,000 | 18,925 | 15,342 | 5001 000 | 26 897 |
| | - | - | • : • · | 20,071 |

| TABLE | 4. | (CONT'D) | - |
|-------|----|----------|---|
|-------|----|----------|---|

| TIME | RANGE | | • | |
|-----------|-----------|------------------|-------------------------------------|----------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 20.426 | 16.098 | 5263.100 | |
| 88,000 | 22.013 | 16,877 | | 26.285 |
| 90,000 | 23,690 | 17 679 | 5536.800 5833.700 | 25,703 |
| 92.000 | 25.460 | 17,679 | 5822 700 | 25,151 |
| 94.000 | | 18.506 | 6121.500 | 24.626 |
| 96-000 | 27 • 328 | 19.359 | 6434 • 100 | 24 • 128 |
| 96.000 | 29.297 | 20.538 | 6761.200 | 23.655 |
| 98 • 000 | 31 • 373 | 21 • 145 | 7103-800 | 23.207 |
| 100.000 | 33.560 | 22•081 . | 7464.800 | 22.784 |
| 102.000 | 35 • 865 | 23 • 0 4 9 | 7841.600 | 22.383 |
| 104-000 | 38.590 | 24 • 048 | 8238.700 | 22=004 |
| 106.000 | 40.845 | 25•081 | 8656.800 | 21.647 |
| 108-000 | 43.534 | 26 • 151 | 9097-600 | 21.311 |
| 110.000 | 46•366 | 27.259 | 9563.600 | 20.496 |
| 115.000 | 49.347 | 28•408 | 10057+300 | 20.700 |
| 114.000 | 52•597 | 29.600 | 10582-100 | 20.423 |
| 116.000 | 55•920 | 30.840 | 11141.500 | 20-165 |
| 118-000 | 59.425 | 32.130 | 11740-100 | 19.926 |
| 120.000 | 63-124 | 33.475 | 12383.500 | 19.705 |
| 122.000 | 67.031 | 34.880 | 13078.300 | 19.503 |
| 124-000 | 71 • 164 | 36+351 | 13833-100 | 19.318 |
| BURN-OUT | OF STAGE | 1 AT | • | I |
| 125.400 | 74.184 | 37.418 | 14136.500 | 19.199 |
| 124 000 | | • | 1 | |
| 126.000 | 75.488 | 37.876 | 14129.800 | 19,148 |
| 128,000 | 79.832 | 39,394 | 14107 600 14086 200 14065 300 | 18,979 |
| 130,000 | 84,172 | 40°897 42.384 | 14086 200 | 18 809 |
| 132,000 | 88,507 | 42.384 | 14065 300 | 18 639 |
| 134.000 | 92.839 | 43.856 | 14044.900 | 18,469 |
| 136.000 | 97.167 | 45.313 | 14024.800 | 18.298 |
| 138.000 | 101.491 | 46.755 | 14005.000 | 18.126 |
| 140.000 | 105.811 | 48 • 182 | 13985.500 | 17.955 |
| 142 ~ 000 | 110.128 | 49.593 | 13966.200 | 17.782 |
| 144.000 | 114.442 | 50.989 | 13947.200 | 17.610 |
| 154.000 | 135.960 | 57•745 | 13854.994 | 16.739 |
| 164.000 | 157 • 396 | 64 • 125 | 13767.800 | 15.859 |
| 174-000 | 178 • 757 | 70.130 | 13685.525 | 14.969 |
| 184-000 | 200-047 | 75.761 | 13608-100 | 14.069 |
| 194.000 | 221 • 272 | 81-019 | 13535.725 | 13.161 |
| 204-000 | 242.436 | 85.905 | 13468.300 | 12.243 |
| 214.000 | 263 • 543 | 92.420 | 13405.844 | 11.317 |
| 224.000 | 284.599 | 94.565 | 13348.400 | 10.384 |
| 234 • 000 | 305+607 | 98.340 | 13296.025 | 9.443 |
| 244 • 000 | 326 • 573 | 101+746 | 13248.600 | 8.497 |
| | | | | |

TABLE 4. (CONT'D)

| TIME | RANGE | | | |
|--------------------|---|---------------------------------------|------------------------|---|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 254.000 | 347.502 | 104.783 | 13206.250 | 7.544 |
| 264,000 | 368,396 | 107,453 | 13169,000 | 6,586 |
| 274.000 | 389.261 | 109.755 | 13136,875 | 5,624 |
| 284.000 | 410-101 | 111•691 | 13109.800 | 4.657 |
| 294.000 | 430 • 921 | 113-259 | 13087.925 | 3.687 |
| 304.000 | 451 • 724 | 114•461 | 13071-000 | 2./15 |
| 314.000 | 472.516 | 115.297 115.767 | 13059 • 375 | 1.740 |
| 324.000 | 493,300 | 115,767 | 13052,700 | ,765 |
| 334.000 | 514.081 | 115.870 | 13051.306 | 211 |
| 344.000 354.000 | 534 • 862 | 115.608 114.980 | 13055.000 13063.756 | -2.163 |
| 364 000 | 555,649 576 445 | 114,700 | 13003,750 | |
| 374,000 | 507 255 | 113,985 | 13077,700 | -3,137 |
| 384 000 | 618 083 | 112,624 | 13096 725 | -4.108 5.074 |
| 394,000 | 638,934 | 110,897 108 803 | 13120,900 | -5. 076 |
| 404,000 | 576,445 597,255 618,083 638,934 659,811 680,719 701,664 | 108,803 106,341 | 13150 175 | -6.041 7.003 |
| 414,000 | 680.719 | 103.512 | 13184 600 13224 000 | -7.002 -7.958 |
| 424.000 | 701.664 | 100.315 | 13224 000 13268 500 | _8°908 |
| 434,000 | 722,647 | 96,750 | 13318 081 | 9 852 |
| 444,000 | 722,647 743,676 | 100 315 96 750 92 814 88 509 | 13372 700 | -1, 750 -8, 908 -9, 852 -10, 789 -11, 720 -12, 641 -13, 555 -14, 460 -15, 356 -16, 242 -17, 118 |
| 454 000 | 764 753 | 88,509 | 13432 325 | 11 720 |
| 464,000 | 785 885 807 074 | 83,833 | 13496 900 | _12 641 |
| 474.000 | 807,074 | 78,786 | 13566 500 13641 000 | _13,555 |
| 484,000 | 828,327 | 73,367 | 13641,000 | _14,460 |
| 494 000 504 000 | 849 647 871 040 | 67, 574 | 13720 519 | _15,356 |
| 504 000 514 000 | 902°511 | 61.407 | 13804 900 | _16,242 |
| 524,000 | 892 [*] 511 914 [*] 064 | 54 864 47 945 | 13894 200 13988 200 | 17.118 |
| 526.000 | 918.385 | 46.516 | 14007.600 | _18.155 |
| 528.000 | 922.710 | _ | | |
| 530.000 | 927.038 | 45• ₀ 72 43•512 | 14026.900 14046.600 | -18.326 -18.497 |
| 532,000 | 931,376 | 42,138 | 14065.800 | -18,668 |
| 534 070 | 935 705 | 40,648 | 14085 719 | 18 838 |
| 536.000 | 940.043 | 39.144 | 14104.500 | _19.007 |
| 538 • 000 | 944.385 | 37.624 | 14124.394 | -19-176 |
| 540+000 | 948.730 | ჰ6•090 | 14141.800 | -19.345 |
| 542.000 | 953.079 | 34.540 | 14160.862 | -19.514 |
| 544.000 | 957.428 | 32.976 | 14175.600 | -19.682 |
| 546 • 000 | 961 • 784 | 31.397 | 14192.633 | -19.849 |
| 548.000 | 966 • 135 | 29.805 | 14201.600 | -20.017 |
| 550.000 | 970 • 490 | 28.198 | 14209.300 | -20.184 |
| 552 • 000 | 974 • 843 | 26.577 | 14211-200 | -20 • 351 |
| 554 • 000 | 979•193 | 24•944 | 14204.100 | -20 +519 |

TABLE 4. (CONT'D)

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| TIME | RANGE | | | |
|--|--|--|------------------------|--|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 556.000 | 983.536 | 23.300 | 14182.800 | -20.686 |
| 550,000 | 987.867 | 21.647 | 14138,600 | -20 854 |
| 560,000 | 992,176 | 19,988 | 14058 300 | -21.024 |
| 564 000 | 990,450 | 18 329 | 13920 200 | _21_196 |
| 556.000 558.000 560.000 562.000 564.000 566.000 568.000 570.000 | 992 176 996 450 1000 666 1004 788 1008 769 | 16,679 | 13690 100 | -21,372 |
| 568 000 | 1004,788 | 15,050 | 13324 000 | _21_555 |
| 570 000 | 1015 643 | 13 464 11 945 10 525 9 236 8 101 | 12771 100 | _21 749 |
| 570 000 572 000 | 1012 542 1016 031 | 11,945 | 11980 200 | _21_960 |
| 574,000 | 1019,161 | 10,525 | 10927 900 9657 600 | _22 198 |
| 576,000 | 1021.877 | 9,230 | 8258 ₇₀₀ | -22,475 |
| 578,000 | 1024,161 | 7,130 | 6857 700 | .22 475 .22 808 .23 219 .23 733 |
| 580 000 | 1026 031 | 6 316 | 5587 600 | 22,722 |
| 582 000 | 1027.542 | 5,642 | 4513,500 | _23 /33 _24 377 |
| 584 000 | 1028,755 | 5.081 | 3653 300 | 25 180 |
| 580 000 582 000 584 000 586 000 | 1029.734 | 4,611 | 2984 000 | 26 170 |
| 200.000 | 1029 734 1030 530 | 4.209 | 2459.400 | 27.371 |
| 590.000 | 1031 • 182 | 3.862 | 2045.200 | -28.811 |
| 592.000 | 1031.718 | 3•556 | 1723.500 | -30.509 |
| 594.000 | 1032 • 165 | 3.583 | 1473.600 | -32.474 |
| 596.000 | 1032.541 | 3•033 | 1279.200 | -34.706 |
| 598.000 | 1032-861 | 2.802 | 1130.500 | -37 • 185 |
| 600.000 | 1033-139 | 2.581 | 1035-100 | -39.851 |
| 602.000 | 1033•387 | 2•363 | 975.500 | - 42•608 |
| 604.000 | 1033-613 | 2.145 | 936.800 | -45.378 |
| 606.000 | 1033.821 | 1.924 | 911-000 | -48-108 |
| 610.000 | 1034 • 014 1034 • 193 | 1.698 | 893 • 700 | -50.760 |
| 612.000 | | 1.468 | 881.900 | -53.310 |
| 614.000 | 1034•361 1034•517 | 1•233 •992 | 874.000 | -55.742 |
| 616.000 | 1034.663 | •748 | 868.100 862.100 | ≈58 • 049 =60 • 330 |
| 618.000 | 1034.799 | •500 | 855.600 | -60 • 230 |
| 620.000 | 1034 • 925 | •250 | 848.500 | -62.291 |
| 621.984 | 1035.041 | 0.000 | 840.964 | -64•234 -66•052 |
| - • | 1000.041 | 0.000 | ~~U * 7 O * | -00.025 |

TABLE 5. TRAJECTORY SD7.20

| | נ שוטחב. | TRAJECTO: | KY SD7.2° | |
|------------------|------------------------|-------------------------------|----------------------|--------------------|
| TIME | RANGE | | 057.2 | |
| FROM | FROM | | | DATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 0.000 | 0.000 | 0,006 | 0.000 | (DEG) |
| 2.000 | 0.000 | .004 | 35,900 | 90.000 |
| 4.000 | 0.000 | .024 | 85,000 | 90.000 |
| 6.000 | 0.000 | .061 | 135 800 | 90,000 90,000 |
| 8,000 | 0,000 | ,114 | 188 300 | 90,000 |
| 10.000 | .007 | .184 | 243 200 | 81,196 |
| 12,000 | .023 | 272 379 | 300 600 | 78 848 |
| 14.000 | .046 | 379 | 360 500 | 76,464 |
| 16,000 | .079 | .503 | 423,100 | 74,072 |
| 18.000 20.000 | .123 | 646 | 488_300 | 71,690 |
| | •180 | .808 | 556,800 | 69.338 |
| 22.000 | •253 | •989 | 628.000 | 67.028 |
| 24.000 | •342 | 1 • 189 | 702-500 | 64.763 |
| 26•000 26•000 | •451 | 1.408 | 780.500 | 62.559 |
| 30.000 | •580 | 1 • 645 | 861.900 | 60.419 |
| 32.000 | •731 | 1.901 | 947.000 | 58 • 346 |
| 34.000 | •907 | 2-176 | 1032-300 | 56.337 |
| 36.000 | 1 • 1 0 8 1 • 3 3 7 | 2•466 | 1120.700 | 54.398 |
| 38.000 | 1.593 | 2.775 | 1210.700 | 52.522 |
| 40.000 | 1.880 | 3.099 | 1303-400 | 50 • 708 |
| 42.000 | 2 • 198 | 3•439 3•794 | 1399.400 | 48•956 |
| 44.000 | 2.550 | 4.164 | 1499.500 | 47.266 |
| 46.000 | 2.936 | 4.548 | 1603-100 | 45 • 636 |
| 48-000 | 3.358 | 4.947 | 1711.500 | 44.069 |
| 50.000 | 3.819 | 5•361 | 1824.500 | 42.562 |
| 52.000 | 4.321 | 5.788 | 1942.500 2065.700 | 41 • 115 |
| 54 • 000 | 4.864 | 6.230 | 2194.200 | 39.727 |
| 56.000 | 5 • 451 | 6.685 | 2329.500 | 38.396 |
| 58.000 | 6.084 | 7 • 155 | 2470.900 | 37.121 |
| 60.000 | 6.766 | 7.639 | 2619.100 | 35.9 ₀₁ |
| 62.000 | 7•498 | 8 • 138 | 2774.400 | 34•/35 33•621 |
| 64.000 | 8.583 | 8 • 651 | 2936.800 | 32.557 |
| 66.000 | 9•123 | 9 • 1 78 | 3106.700 | 31.542 |
| 68.000 | 10.051 | 9•720 | 3284.100 | 30.573 |
| 70.000 72.000 | 10.979 | 10.278 | 3469.6nn | 29.650 |
| 74.000 | 11.999 | 10.850 | 3663.300 | 28.169 |
| 76.000 | 13.085 | 11.439 | 3865.500 | 27,931 |
| 78 000 | 14.239 | 12,042 | 4076.800 | 27,132 |
| 80.000 | 15,463 | 12,663 | 4297 400 | 26 371 |
| 82.000 | 16.762 | 13.299 | 4527.800 | 25.647 |
| 84.000 | 18.138 | 13.953 | 4768.200 | 24.959 |
| | 19.593 | 14.624 | 5019.300 | 24.303 |

| TABLE 5. ((| ONT 'D' | ` |
|-------------|---------|---|
|-------------|---------|---|

| | | • | / | |
|--|---|--|------------------------|--------------------------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | |
| (SEC) | (IMI) | (NMI) | (FT/SEC) | ANGLE |
| 86.000 | 21.133 | 15.313 | 5281.400 | (DEG) |
| 88,000 | 22,759 | 16,021 | 5555 100 | 23.680 |
| 90.000 | 24.476 | 16.747 | 5841.100 | 23.088 22 . 526 |
| 92.000 | 26 • 288 | 17.494 | 6140-100 | |
| 94.000 | 28•199 | 18•261 | 6452.900 | 21.992 |
| 96.000 | 30.213 | 19.050 | 6780.400 | 21•485 |
| 98.000 | 32 • 335 | 19.862 | 7123.400 | 21 • 005 |
| 100.000 | 34 • 569 | 20.697 | 7483.300 | 20.550 |
| 102.000 | 36•922 | 21.557 | 7863.200 | 20-119 |
| 104.000 | 29.400 | 22.443 | 8260-100 | 19.712 |
| 106.000 | 42.006 | 23+357 | 8679.600 | 19.327 |
| 108.000 | 44.751 | 24 • 301 | 9121.600 | 18.965 |
| 110.000 | 47.640 | 25.275 | 9588.900 | 18.624 |
| 112.000 | 50.783 | 26.284 | 10084-100 | 18.304 |
| 114-000 | 53.999 | 27•328 | 10610-300 | 18·003 17·/23 |
| 116.000 | 57-388 | 28-411 | 11171-300 | 17.461 |
| 118.000 | 60•961 | 29.536 | 11771-600 | 17.219 |
| 120.000 | 64.732 | 30.706 | 12416.500 | 16.995 |
| 122.000 | 68.714 | 31.926 | 13113.000 | 16.790 |
| 124.000 | 72.926 | 33.202 | 13869.500 | 16.603 |
| BURN-OUT | 05 57405 | | | 100003 |
| COVIA-ODI | OF STAGE | 1 AT | | |
| 125.400 | 76.004 | 3/ 105 | | |
| | ,00004 | 34.125 | 14174.100 | 16,482 |
| | | | | |
| 126.000 | 77.333 | 24 621 | 14147 4 | |
| 128,000 | 01 700 | 34.521 | 14167,600 | 16,431 |
| 130,000 | 86,181 90,599 95,014 99,424 103,832 108,236 112,636 117,034 121,429 | 35,833 | 14146,200 | 16,259 |
| 132,000 | 90 500 | 37,129 | 14126,000 | 16 088 15 915 15 743 15 570 |
| 134,000 | 95 014 | 38,410 | 14106,700 | 15,915 |
| 136,000 | 99 424 | 39,675 | 14088 200 | 15,743 |
| 138,000 | 103 822 | 40,926 | 14070,200 | 15,570 |
| 140,000 | 108,536 | 42.161 | 14052,700 | 15,397 |
| 142 000 | 112 636 | 43,382 | 14035 600 14018 800 | 15,223 |
| 144 000 146 000 | 117.034 | 45°778 | 14002,400 | 15 397 15 223 15 049 14 874 |
| 146 000 | 121 429 | 46 054 | 14002 400 | 14,874 |
| | 125 820 130 209 | 40,934 48,115 | 13986 200 | 14,699 14,524 14,348 |
| 150 000 152 000 | 130 209 | 49 260 | 13970 300 13954 600 | 14,524 |
| 152,000 | 134 595 156 482 | 50 391 | 13939 131 | 14 348 |
| * V = U () () | 156 482 | 55 822 | 13865 000 | 14 172 |
| 112 000 | 178°304 200°065 | 44 528 45 778 46 954 48 115 49 260 50 391 55 822 60 880 65 568 69 886 73 834 | | 13 287 12 394 11 492 |
| 182,000 | 200,065 | 65 568 | 13795 775 | 12.394 |
| 192,000 | 221,771 | 69 886 | 13731 600 | 11,442 |
| 202,000 | Z\$3,425 | 73.834 | 13672 325 | 10,263 |
| 182 000 192 000 202 000 212 000 | 265 033 | 77,413 | 13618 000 13568 750 | 7,00/ |
| | ₩ | • • • • • • | -3000,130 | 8,745 |
| | | 00 | | |

TABLE 5. (CONT'D)

| | | | - | |
|--------------------|-------------------------------|--|---|--|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 222.000 | 286.600 | 80.624 | 13524.500 | 7.817 |
| 232,000 | 308.129 | 83.468 | 13485,150 | 6.883 |
| 242,000 | 329 626 | 85 944 | 13450 900 | |
| 252,000 | 351 095 | 88 054 | 13421 731 | 5.946 5.004 |
| 252 000 262 000 | 329,626 351,095 372,541 | 89 798 | 13397 600 | 4 058 |
| 2/2,000 | 393 967 | 85 944 88 054 89 798 91 175 92 187 | 13421 731 13397 600 13378 500 13364 500 | 3 110 |
| 282.000 | 415.380 | 92.187 | 13364.500 | 2.159 |
| | 436.782 | 92.832 | 12255.525 | |
| 302.000 | 458.179 | 93.113 | 13355.525 13351.600 | 1• <u>208</u> •254 |
| 312-000 | 479.574 | 93.028 | 13352-806 | 699 |
| 322.000 | 500.973 | 92.577 | 13359.000 | -1.651 |
| 332.000 | 522,379 | 91.760 | 13370,356 | -5,605 |
| 342.000 | 543.797 | 90.579 | 13386.800 | -3.552 |
| 352.000 | 565.232 | 89.031 | 13408.200 | -4.499 |
| 362-000 | 586 • 689 | 87-117 | 13434.700 | -5.443 |
| 372.000 | 608.170 | 84 • 836 | 13466.281 | -6.383 |
| 382.000 | 629,682 | 82.188 | 13502,900 | -7,319 |
| 392,000 | 651,227 | 79,173 75,791 | 13544 481 | -8 250 |
| 402,000 | 672,813 | 75,791 | 13544 481 13591 100 | 9 176 |
| 412.000 | 694,442 | 72:039 | 13642.725 | _10.095 |
| 422.000 | 716:120 | 67.920 | 13699.300 | -11.008 |
| 432 •000 | 737.850 | 63.430 | 13760.819 | -11.913 |
| 442.000 | 759•639 | 58•569 | 13827.300 | -12.811 |
| 452.000 | 781•491 | 53•337 | 13898.687 | -13./01 |
| 462.000 | 863.410 | 47.733 | 13974.800 | -14.582 |
| 464.000 | 807.802 | 46.567 | 13990.625 | -14.757 |
| 466.000 | 812,197 | 45.387 | 14006.400 | -14 A32 |
| 468,000 | 816,596 | 44,192 | 14022 475 | _15 106 _15 280 _15 454 _15 627 _15 800 _15 973 |
| 470,000 | 820 997 | 42,981 | 14038 400 | _15 280 |
| 472,000 | 825,401 | 41,756 | 14054 675 | _15_454 |
| 474.000 | 85ă 808 | 40,516 | 14070 400 | -15,627 |
| 476.000 | 834,218 | 39,261 | 14086 737 | _1 5_800 |
| 478,000 | 838,630 | 37,991 | 14102,000 | _15_973 |
| 480,000 | 843.046 | 36,706 | 14118,025 | -10-142 |
| 482,000 | 847,463 | 35,407 | 14132,000 | -16,317 |
| 484,000 | 851,884 | 34.092 | 14147,325 | _16,488 |
| 486,000 | 856.304 | 32,763 | 14158,600 | -16 ,660 |
| 488,000 | 860.729 | 31,420 | 14171,987 | -16,832 |
| 490.000 | 865,152 | 30.063 | 14118 025 14132 000 14147 325 14158 600 14171 987 14178 600 14188 400 | -17.002 |
| 492.000 | 869,581 | 28,689 | 14188,400 | -17,172 |
| 494.000 | 873,999 | 27.306 | 14185,600 | -17.344 |
| 496.000 | 878,420 | 25,907 | 14185 600 14180 700 14166 700 | -17,514 |
| 498,000 | 882,835 | 24,497 | 14166,700 | -17.002 -17.172 -17.344 -17.514 -17.685 |
| | | | | |

TABLE 5. (CONT'D)

I

| TIME | RANGE | | | |
|-------------------------------|--------------------|----------------------------|---|---------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 500.000 | 297.241 | 23.07. | (FT/SEC) 1413 _{8•9} 00 | (DEG) |
| 502,000 | 891,633 | 21,643 | 14090_300 | -17·857 |
| 504,000 | 891,633 896,003 | 20 205 | 14010 900 | -18,029 |
| 506 000 | 900 339 | 18 763 | 13885 200 | _18 202 |
| 504 000 506 000 508 000 | 904 623 | 20 205 18 763 17 325 | 13885°200 13690°400 | 18 378 |
| 510,000 | 908.830 | 15.899 | 13395.200 | _18 558 |
| 512.000 | 912.922 | 14.496 | 12968.000 | _18.743 |
| 514-000 | 916.853 | 13•134 | 12372.400 | -18.937 |
| 516.000 | 920.567 | 11.832 | 11581.000 | -19-144 |
| 518,000 | 924.001 | 10,613 | 10591.000 | -19.371 |
| 520,000 | 927,098 | 9 497 | | -19,625 |
| 522,000 | 929 821 | 8,499 | 9445_600 8267*700 | _19,918 _20,263 |
| 24 ,000 | 932 154 | 9 497 8 499 7 626 | 8207°700 6968°500 | |
| 526.000 | 934.113 | 6.876 | 5822.000 | -20,679 |
| 528 • 000 | 935•736 | 6•236 | | _21,185 |
| 530.000 | 937.070 | 5.692 | 4820•8 ₀₀ 3973•900 | -21 •803 |
| 532,000 | 938,165 | 5,227 | 3290,900 | -22.560 |
| 534.000 | | 4.824 | 2747 800 | -23,479 |
| 536,000 | 939.069 939.819 | 4,471 | 2309 200 | -24,582 -25,893 |
| 538,000 | 946,443 | 4,157 | 1955 300 | 27 422 |
| 540,000 | 940,967 | 3,875 | 1955 300 1675 900 | -27 432 |
| 542,000 | 941,411 | 3,617 | 1675,900 1453,000 | -29,216 |
| 544.000 | 941.789 | 3,377 | 1276 400 | -31,249 |
| 546.000 548.000 550.000 | 942,114 | 3.151 | 1137 800 | -33,528 |
| 548,000 | 942,398 | 2 934 | 1044 400 | _36_036 _38_721 |
| | 942.653 | 2.719 | 1276 400 1137 800 1044 400 984 600 | -41.498 |
| 552.000 | 942•885 | 2.504 | 945.300 | -44.293 |
| 554.000 | 943.099 | 2.284 | 918.800 | -47. ₀₅₁ |
| 556.000 | 943.298 | 2.061 | 900.800 | -49.737 |
| 558.000 | 943•483 | 1.832 | 888.400 | -52.323 |
| 560.000 | 943•655 | 1.598 | 880.000 | ~54·794 |
| 562.000 | 943•817 | 1 • 358 | 874-100 | -57.142 |
| 564.000 | 943.968 | 1.114 | 869.800 | -59.362 |
| 566.000 | 944.109 | • 866 | 865.400 | -61.456 |
| 568.000 | 944.240 | .614 | 860,100 | -63.429 |
| 570,000 572,000 | 944,362 | 360 | 854 000 | _65 287 |
| 5/2,000 | 944,475 | 104 | 854 000 847 000 | _65 287 _67 036 |
| 572.808 | 944.518 | 0.000 | 843,973 | -67,712 |
| | | | ~ ' | - · · · · · |

TABLE 6. TRAJECTORY SD7.60

| | | | C 057.0 | |
|------------------|-----------------|-------------------------|--|------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90,000 |
| 4.000 | 0,000 | .024 | 85,000 | 90,000 |
| 6,000 | 0.000 | .061 | 135,800 | 90,000 |
| 8,000 | 0.000 | ,114 | 188 300 | 90,000 |
| 10,000 | .008 | .184 | 243,300 | 80,708 |
| 12,000 | 024 | 272 | 300,700 | 78 232 |
| 14,000 | .049 | 378 | 360 800 | 75 721 |
| 16,000 | 083 | .502 | 423,700 | 73,204 |
| 18,000 | .130 | .645 | 489,100 | 70,701 |
| 20,000 | 190 | ,806 | 558 100 | 68,233 |
| 22.000 24.000 | .267 | .986 | 629,700 | 65,813 |
| 26,000 | .361 | 1.184 | 704 800 783 400 | 63,443 |
| 28,000 | 475 | 1,401 | 783,400 | 61,141 |
| 30,000 | .610 .769 | 1.636 1.889 | 865 600 | 58,911 |
| 32,000 | 954 | 2,160 | 951 300 1037 500 | 56,753 |
| 34,000 | 1,165 | 2.100 | 1126,700 | 54 666 52 654 |
| 36,000 | 1,404 | 2,446 2,749 | 1217 600 | 52 654 50 711 |
| 38 000 | 1,672 | 3 066 | 1311 200 | 50 711 48 836 |
| +0_000 | 1,972 | | 1400 200 | 4.7° 0. 7 |
| 42 ,000 | 2 304 | 3 398 3 745 4 104 | 1500 300 | 45 284 43 607 |
| 44,000 | 2,671 | 4_104 | 1613°800 | 43°607 |
| 46,000 | 3,073 | 4.4// | 1723 160 | 41,995 |
| 48,000 | 3 513 | 4 863 | 1837 000 | 40 449 |
| 50,000 | 3,992 | 5,262 | 1956 000 | 40 449 38 965 |
| 52.000 | 4.513 | 5.673 | 1509 300 1613 800 1723 100 1837 000 1956 000 2079 900 | 37.542 |
| 54.000 | 5.076 | 6•096 | 2209.200 | 36.180 |
| 56.000 | 5.685 | 6•531 | 2344.800 | 34.877 |
| 58.000 | 6.340 | 6.979 | 2486.800 | 33.631 |
| 60.000 | 7.045 | 7.438 | 2635.300 | 32.440 |
| 62.000 | 7.801 | 7.909 | 2790 • 900 | 31 • 303 |
| 64.000 | 8.611 | 8•393 | 2953.500 | 30.218 |
| 68.000 | 9.477 10.401 | 8.888 9.395 | 3123.400 | 29.184 |
| 70.000 | 11.386 | 9,915 | 3300.800 | 28,197 |
| 72,000 | 12,435 | 10,446 | 3486,200 3679,700 | 27.257 |
| 74.000 | 13.549 | 10.990 | 3881.600 | 26.361 25.507 |
| 76.000 | 14.732 | 11.547 | 4092.400 | 24.695 |
| 78.000 | 15.986 | 12.116 | 4312.600 | 23.921 |
| 80.000 | 17.316 | 12.698 | 4542.400 | 23 • 185 |
| 82.000 | 18.722 | 13.293 | 4782.200 | 22.485 |
| 84.000 | 20.510 | 13.902 | 5032.600 | 21.819 |
| | | | 20223-00 | 51.01) |

| TABLE 6. (| COMT'D) | į |
|------------|---------|---|
|------------|---------|---|

| | | (| -, | |
|--------------------|---------------------------------------|------------------|------------------------|----------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 21.782 | 14.525 | 5294.100 | |
| 88,000 | 23,442 | 15,162 | 5567 200 | 21.186 |
| 90 000 | 25 193 | 15 814 | 5852 500 | 20,585 |
| 92,000 | 27 039 | 15 814 16 481 | 6150 900 | 20.014 |
| 94 000 | 25 193 27 039 28 986 | 17.164 | 6463°000 | 19,471 |
| 96.000 | 31.036 | 17,164 | | 18 957 |
| 98.000 | | 17.863 | 6789.800 | 18,469 |
| | 33 • 194 | 18.580 | 7132-300 | 18.007 |
| 100.000 | 35 • 467 | 19+315 | 7491.700 | 17.570 |
| 102.000 | 37.859 | 20.069 | 7869.200 | 17.157 |
| 104.000 106.000 | 40+375 | 20.844 | 8266.100 | 16.767 |
| 108,000 | 43.023 | 21.639 | 8686.900 | 16,399 |
| | 42,011 | 22,459 | 9127,800 | 16,05% |
| 110,000 | 45.811 48.742 51.937 55.200 | 23,302 | 9595 900 | 15,723 |
| 112,000 | 51,731 | 24,171 | 10091 500 | 15 424 |
| 114,000 | 55,200 | 25,069 | 10618 300 | 15,139 |
| 116,000 | 58,639 62,264 | 25,998 | 11179,900 | 14 874 |
| 118 000 120 000 | 02,204 | 26,959 | 11780 800 | 14 629 |
| 120,000 | 66 089 70 129 | 27,95 | 12426 400 | 14,402 |
| 122,000 | 70,129 | 28,995 | 13123 600 | 14 194 |
| 124,000 | 74,401 | 30,077 | 13880 700 | 14,004 |
| RURN-OUT | OF STAGE | 1 4- | | • |
| 20414-001 | OF STAGE | 1 AT | | |
| 125.400 | 77.523 | 30.859 | 14185.800 | 12 402 |
| | | 300037 | 14102.000 | 13,882 |
| | | | | |
| 126.000 | 78.871 | 31.195 | 14178.800 | 13 430 |
| 128.000 | 83,359 | 32,303 | | 13.830 |
| 130,000 | 87 842 | 33,395 | 14156,100 | 13,656 |
| 132.000 | 87 ⁸ 42 92 . 321 | 34.472 | 14135,400 14116,100 | 13.482 |
| 134.000 | 96.796 | 35.534 | | 13.308 |
| 136.000 | 101-267 | 36.581 | 14098 • 000 | 13 • 133 |
| 138.000 | 105.735 | | 14080.800 | 12.958 |
| 140.000 | 110 • 199 | 37.613 | 14064.500 | 12.782 |
| 142.000 | 114.661 | 38+629 39-431 | 14048.900 | 12.606 |
| 144.000 | 119.119 | 39+631 | 14033.900 | 12.429 |
| 146.000 | 123.574 | 40•618 41•590 | 14019.400 | 12.253 |
| 148 • 000 | 128.027 | 42.547 | 14005-400 | 12.076 |
| 150.000 | 132.478 | 43.489 | 13991 • 700 | 11.898 |
| 152.000 | 136.925 | | 13978.400 | 11./51 |
| 154.000 | 141+371 | 44.416 | 13965.300 | 11.543 |
| 156.000 | 141.3/1 | 45.328 | 13952.600 | 11.364 |
| 158 • 000 | 150 • 253 | 46.226 | 13940 • 200 | 11.186 |
| 160.000 | 150 • 253 154 • 692 | 47·109 | 13927.987 | 11.007 |
| 162.000 | 159.128 | 47•977 49•93• | 13916.000 | 10.858 |
| 164.000 | 163.562 | 48.830 | 13904.256 | 10.648 |
| 1-4-000 | 105.205 | 47.668 | 13892.700 | 10.469 |

TABLE 6. (CONT'D)

| TIME | RANGE | | | |
|--------------------|--|--------------------------------------|-------------------------------------|---------------------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TITUDE | | PATH |
| (SEC) | (NMI) | ALTITUDE | | ANGLE |
| 166.000 | 167.994 | (NMI) | ** ** 350 | (DEG) |
| 176,000 | 190.123 | 50-491 | | 10.289 |
| 185 000 | 212 204 | 54,387 | | 9, 385 |
| 196,000 | 212 204 234 244 | 57 914 | | 8 475 |
| 206_000 | 256 246 | 61,072 | 13736 100 | 7 450 |
| 516,000 | 278 215 | 64,004 | 13697 706 | A 630 |
| 556,000 | 256,246 278,215 300,156 | 63 862 66 284 68 340 70 029 | 13664 400 | 5 714 |
| 236,000 | 322 073 | 70 000 | 13636 025 | 4 (85 |
| <+0.000 | 322.073 343.972 | 70.029 | 136:2 700 | 4 XE2 |
| 256.000 | 365.857 | 71 351 | 13594 475 | 2 919 |
| 266-000 | 387.732 | 72.307 | 13581.300 | 2°419 1°482 |
| 276.000 | 409.603 | 72.898 | 13573-175 | 1.044 |
| 286,000 | 431.472 | 73.122 | 13570.000 | .106 |
| 296,000 | 453 346 | 72,980 | 13572,000 | 833 |
| 306,000 | 453,346 475,228 | 72,472 | 13579,000 | -1 /71 |
| 316,000 | 497.123 | 71,599 | 13591 081 | -1.771 -2.708 |
| 326,000 | | 70.359 | 13608,200 | -3,643 |
| 336,000 | 540 972 | 68,753 | 13630 325 | -4 276 |
| J+5_000 | 540,972 562,935 584,928 606,959 629,030 651,147 673,314 677,754 | 66,779 | 1305/200 | -4,576 -5,505 -6,431 |
| აან_მტტ | 584 928 | 64,440 | 13007 /25 | _6 431 |
| 300,000 | 606 959 | 61,732 | 13726 900 | -7 352 -8 269 -9 180 -10 086 |
| 3/0_000 | 629°030 | 58,657 | 13769°125 13816°300 | -8 269 |
| აიი ეეე | 651 147 | 55,214 | 13816 300 | -9 180 |
| 396.000 | 673 314 | 51,401 | *3000 431 | -10.086 |
| 348 000 | 677 754 | 47,220 | 1.14/3 /00 | -10.984 |
| 400_0nn | 682 196 | 46.339 | 13937°150 13949°100 13961°344 | -11 163 |
| 402 000 404 000 | 686 641 | 45,443 | 13949,100 | -11,342 |
| 404 000 | 691 087 | 44.533 | 13961 344 | 11 520 |
| 700,000 | 695 526 | 43,608 | | _11 698 |
| 4 00_000 | 699 927 | 42,668 41,713 | 13986 031 | _11_876 |
| 410,000 | 704.440 | 41,713 | 13998 300 | _12_054 |
| +12.000 | 708.895 | 40.744 | 14010 900 14023 100 | 12 231 |
| 414.000 | 713.353 | 39.759 | 14023,100 | -12.408 |
| 416.000 | 717.813 | 38 • 759 | 14035.637 | -12-585 |
| 418 • 000 | 722.275 | 37.746 | 14047.500 | -12./61 |
| 420 • 0nn | 726.738 | 36 • 717 | 14059.769 | -12.937 |
| 422.000 | 731.204 | 35.673 | 14070.700 | -13-113 |
| 424.000 | 735.670 | 34.615 | 14082.319 | ~13.289 |
| 426.000 | 740.139 | 33.543 | 14091.700 | -13.464 |
| 428.000 | 744.607 | 32 • 455 | 14101.762 | -13.639 |
| 430.0nn | 749.077 | 31 • 354 | 14108.400 | -13.814 |
| 432•000 | 753.544 | 30.238 | 14115.900 | -13.989 |
| 434.000 | 758-011 | 29.108 | 14117.700 | -14-163 |
| - 4 • | . 2011 | 27•964 | 14118.000 | -14+338 |
| | | | | |

TABLE 6. (CONT'D)

| | IAL | PE O. (COMI | (ע' | |
|-------------------------------|--------------------|--|--------------------------------|--------------------------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | BATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 436.000 | 762.476 | 26.806 | 14114.000 | (DEG) |
| 438,000 | 766,936 | 25,636 | 14104,100 | -14.513 |
| 440 000 442 000 | 771 390 | 24 452 | 14086 300 | -14,688 |
| 442,000 | 775 835 | 24 452 23 257 | 14056 900 | -14,863 |
| 444_000 | 780 266 | 22 052 | | .15 039 .15 215 |
| 440.000 | 780 266 784 676 | 22,052 20,837 | 14011 300 | -15,215 |
| 448,000 | 789.059 | 10 414 | 13943,000 | -15,393 |
| 450,000 | / 72 BND | 19.616 18.392 17.170 15.935 14.758 13.589 | 13842 700 | .15,393 .15,573 .15,755 |
| 452 000 | 797 684 | 17 170 | 13697 600 | 15,755 |
| 454,000 | 801 888 | 18 035 | 13489 900 | _15 942 |
| 456,000 | 805.981 | 14 759 | 13197 400 | _16_135 |
| 458,000 | 809,926 | 17,730 | 12799 900 | _16_337 |
| 460,000 | 813,681 | 13,307 | 12274,900 | -16,551 |
| 402.000 | 817, 199 | 12.461 11.388 | 11605 300 | 16 135 16 337 16 551 16 782 |
| 464,000 | 820 434 | 11,300 | 10787 000 | -17,036 |
| 466,000 | 823 353 | 10,385 | 9837,900 | _17_036 _17_321 |
| 468,000 | 825 924 | 9,463 | 8797,900 | _17,648 |
| 470,000 | 825 934 838 173 | 8,631 | 7714,600 | -18,029 |
| 472,000 | 828,173 | 7,891 | 6655,400 | _18_478 |
| 474.000 | 830.089 | 7,241 | 5677,100 | -19,011 |
| 476,000 | 831,711 | 6,671 | 4809,000 | -19.011 -19.648 |
| 478,000 | 833.076 | 6,173 | 4055 300 | -20,407 |
| 480.000 | 834.221 | 5,737 | 3417,700 | -21,312 |
| 482,000 | 835,181 | 5,352 | 2896 900 | -22,382 |
| 484,000 | 835,991 836,676 | 5,008 | 2468 500 | -23,636 |
| 486 000 | 836,676 837,357 | 4,698 | 2115,400 | -25 092 |
| 486 000 488 000 | 837 257 837 753 | 4,415 | 1825_400 | -25 092 -26 768 |
| 490 000 | 837,753 | 4,155 | 1592,800 | -28 672 |
| 490 000 492 000 | 838,180 | 3,911 | 1402,100 | -30 805 |
| 494 000 | 838,549 | 3,681 | 1248,300 | _33_161 |
| 494,000 | 838,870 | 3,460 | 1125 506 | -35 720 |
| 496 000 498 000 500 000 | 839 154 | 3,460 3,246 | 1041 400 | 38 433 |
| 500 000 | 839,409 | 3,033 | 1041 400 986 000 948 900 | -41,223 |
| 502 000 | 839 643 | 2 R18 | 948 900 | _44 021 |
| 502 000 504 000 | 839 859 | 2 599 | 923 [*] 6nn | _46 780 |
| 504.000 | 840.060 | 2.374 | 906.000 | -49.464 |
| 506.000 | 840.247 | 2•145 | 893•9 ₀₀ | -52.049 |
| 508.000 510.000 | 840.422 | 1.910 | 885.400 | -54.521 |
| 512,000 | 840.585 | 1.671 | 879.500 | -56.870 |
| 514 000 | 840,738 | 1,426 | 875,100 | -59,093 |
| 514 000 516 000 | 840.881 | 1,176 | 875,100 871,900 | _61 190 |
| 518 000 | 841 015 | •923 | 868 600 | _63 163 |
| 518.000 | 841.139 | •666 | 864.100 | -65.018 |
| 520.000 | 841.255 | •408 | 858.600 | -66.763 |
| 522.000 | 841.363 | •147 | g51.900 | |
| 523,131 | 841,420 | 0.000 | 847.577 | -68.404 |
| | | - 9 - 4 | 041.011 | -69,289 |

TABLE 7. TRAJECTORY SD8.0°

| TIME | RANGE | | | |
|--|----------------------------|----------------|----------------------|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NHI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90.000 |
| 4.000 | 0.000 | 024 | 85,000 | 90,000 |
| 6,000 | 0.000 | 061 | 135 800 | 90,000 |
| 8,000 | 0,000 | 114 | 188 300 | 90,000 |
| 10,000 | .008 | .184 | 243,300 | 80.220 |
| 12,000 | .025 | 272 | 300,000 | 77,617 |
| 14.000 | .051 | 378 | 361,200 | 74.980 |
| 16,000 | .088 | 502 | 424.300 | 72,338 |
| 18,000 | .136 | .644 | 490,000 | 69,716 |
| 20,000 | .200 | 804 | 559,400 | 67,134 |
| 22,000 | .280 | 983 | 631,500 | 64,606 |
| 24,000 | .379 | 1,180 | 707,200 | 62,135 |
| 26,000 | 498 | 1 395 | 786 500 | 59,739 |
| 58.000 | ,640 | 1,627 | 869,400 | 57,421 |
| 30,000 | .807 | 1,877 | 955 900 | 55 183 |
| 32,000 | 1,000 | 2,143 | 1042,900 | 53,022 |
| 34,000 | 1,220 | 2,425 | 1132,800 | 50,942 |
| 36,000 | 1,470 | 2,722 | 1224 700 | 48 937 |
| 38,000 | 1,750 | 3,033 | 1319,200 | 47,004 |
| 40.000 | 5.065 | 3 357 | 1417 300 | 45 142 |
| 42,000 | 2,408 | 3,694 | 1519,200 | 43,352 |
| 44.000 | 2,789 | 4.043 | 1624,700 | 41,631 |
| 46,000 | 3.207 | 4.404 | 1735,000 | 39,980 |
| 48,000 | 3,663 | 4.777 | 1849,700 | 38,397 |
| 50,000 | 4.160 | 5.161 | 1969 500 | 36,880 |
| 52,000 | 4.699 5.303 | 5,555 | 2094 100 | 35,427 |
| 54,000 | 5,282 | 5,960 | 2224 100 | 34 038 |
| 56,000 | 5,910 | 6.374 | 2359,900 | 32,709 |
| 58,000 | 6,587 7,313 | 6,799 | 2502,500 | 31,440 |
| 60.000 62.000 | 8,091 | 7.234 | 2651,100 | 30.228 |
| 64,000 | 8,924 | 7.678 | 2806,800 | 29,071 |
| 66,000 | 9.813 | 8,131 8,594 | 2969 300 | 27,968 |
| AR DAD | 10.762 | 9 067 | 3139,100 | 26,916 |
| 70 000 | 11,771 | 9.067 9.548 | 3316,200 | 25,914 |
| 72.000 | 12.844 | 10.039 | 3501,100 3694,000 | 24 958 24 049 |
| 70 000 72 000 74 000 76 000 78 000 80 000 82 000 84 000 | 13.984 | 10,539 | 3895 200 | 24,049 23,182 |
| 76 000 | 13 984 15 192 | 11.049 | 3895°200 4105°100 | 22 358 |
| 78,000 | 15,473 | 11,567 | 4324 200 | 21,573 |
| 80.000 | 17.828 | 12.096 | 4552 900 | 50.856 |
| 82,000 | 17,828 19,262 20,776 | 12,633 | 4791 400 | 20 115 |
| 84,000 | 20.776 | 13,180 | 5040 500 | 19,440 |
| - | • 🕶 | ▼ | • | • • |

| TABLE | 7. | (CONT'D) |
|-------|----|----------|
| | | |

Secondary of the second

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| | TA | RRIF: \ | T'D) | |
|----------------------------|---|--|--|-------------------------|
| TIME | RANGE | | , | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TYTURE | | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| 86.000 | (NWI) | (NMI) | (FT/SEC) | (DEG) |
| 88 000 | 22.375 | 13.738 | 5300.500 | 18.798 |
| 88,000 | 24.062 | 14,305 | 5572 000 5855 700 | 18,188 |
| 90 000 92 000 94 000 | 25,840 | 14,883 | 5855 700 | 17 600 |
| 92,000 | 27,714 | 15,471 | 6152 400 | 17,608 |
| 94,000 | 29,688 | 16,071 | 6462 700 | 17,058 |
| 90. 000 | 31.765 | 16.682 | 6152 400 6462 700 6787 700 | 16,536 |
| 98•000 | 33+952 | 17.306 | | 16.042 |
| 100.000 | 36.253 | 17.942 | 7128-300 | 15.573 |
| 102.000 | 38 • 673 | | 7485.700 | 15•130 |
| 104.000 | 41.218 | 18.592 | | 14.711 |
| 106.000 | 43.895 | 19.257 | 8256.400 | 14.315 |
| 108,000 | | 19.936 | 8672,700 | 13,942 |
| 110,000 | 46,711 | 20,633 | 9115,700 | 13,591 |
| 112 000 | 49,773 | 21,347 | 8672.700 9115.700 9580.200 10075.200 10600.800 | 13,261 |
| 112,000 | 52,901 | 22,080 | 10075 200 | 12,952 |
| 114.000 | 50, 198 | 22 834 | 10600 800 | 12,463 |
| 116,000 | 5 9 670 | 23,611 | 11161 200 | 12,663 |
| 118,000 | 63,330 | 24,412 | 11760 900 | 12,395 |
| 120 000 122 000 | 67,190 | 25.240 | 12405,400 | 12,145 |
| 155.000 | 63,330 67,190 71,267 75,578 | 26 099 | 13101 500 | 11,915 |
| 124,000 | 75 578 | 26,991 | 13857*300 | 11,104 |
| • | • | • , , , | 13031,300 | 11,512 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 1 | 000 | • " | | |
| 125.400 | 78.729 | 27 424 | | |
| | • • • | 27.634 | 14161,500 | 11.387 |
| 1 | | | | |
| 126.000 | 80.088 | | | |
| 128,000 | | 27.910 | 14152.700 | 11.335 |
| 130.000 | 84.615 | 28.817 | 14124.500 | 11,158 |
| 132,000 | 89,135 | 29,709 | 14099_300 | 10,981 |
| 132,000 | 93.649 98.158 102.662 | 30,585 | 14076 600 | 10 804 |
| 134.000 | 98,158 | 31,446 | 14056,000 | 10 624 |
| 136,000 | 105,665 | 32,292 | 14037 200 | 10,626 |
| 138,000 | 107,162 | 33,122 | 14019 800 | 10,448 |
| 140.000 | 111,657 | 33 937 | 14003 600 | 10,269 |
| 142 000 | 116 149 | 33,937 34,737 | 13988 400 | 10 089 9 910 |
| 144.000 | 120 638 | 35,522 | 13700 400 | 9,910 |
| 146.000 | 125 124 | 34,362 | 13974 200 | 9,730 |
| 148 000 | 129 607 | 36,292 37,047 | 13960 700 | 9.730 9.550 |
| 150.000 | 134 087 | 37,047 | 13947 800 | 9 369 |
| 152.000 | 102.662 107.162 111.657 116.149 120.638 125.124 129.607 134.087 138.565 | 37,787 | 13935,600 | 9.369 9.188 9.007 |
| 154.000 | 200,000 | 39.215 | 13753,700 | 9 007 |
| 156,000 | * ' T & V T V | 39.222 | 13912.700 | 8 826 8 644 8 462 |
| 158 000 | 147,514 | 39,917 | 13902,000 | 8 644 |
| 158 000 160 000 | 151 985 156 454 | 40.597 | 13831 000 | 8 462 |
| 162 000 | 120,454 | 41,263 | 13881 600 | 8 28 4 |
| 105,000 | 160,921 | 39 917 40 597 41 263 41 913 42 549 | 13872,000 | 8.097 |
| 164,000 | 165,386 | 42,549 | 13862 600 | 7,915 |
| | | • | | , , , , , , |

TABLE 7. (CONT'D)

| TIME | RANGE | | | |
|--|---|------------------|------------------------|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 166.000 | 164.850 | 43-170 | 13853.600 | 7.732 |
| 168,00 | 174.312 | 43.776 | 13844.800 | 7.549 |
| 170,000 | 178,772 | 44 367 | 13836 400 | 7,549 7,366 |
| 172,000 | 183,230 | 44 944 | 13828 100 | 7 182 |
| 170 000 172 000 174 000 | 187 687 | 45,505 | 13820 200 | 6 998 |
| 110,000 | 192,143 | 46,052 | 13812 400 | 6 814 |
| 1.0 000 | 196,597 | 46,584 | 13804 900 | 6 630 |
| 180.000 | 201.049 | 47c102 | 13797.700 | 6,446 |
| 182.000 | 205.501 | 47.604 | 13790-600 | 6.262 |
| 184-000 | 209.951 | 48.092 | 13783.800 | 6.077 |
| 186-000 | 214-400 | 48,565 | 13777-200 | 5.892 |
| 188-000 | 218.847 | 49.023 | 13770-800 | 5.707 |
| 190.000 | 223.293 | 49•466 | 13764-606 | 5•522 |
| 192.000 | 227.739 | 49.895 | 13758.600 | 5•337 |
| 194.000 | 232-183 | 50.309 | 13752.850 | 5•152 |
| 204.000 | 254 • 389 | 52•157 | 13727 • 100 | 4.223 |
| 214.000 | 276.573 | 53.636 | 13706.481 | 3.291 |
| 224 • 000 234 • 000 | 298.742 | 54.747 | 13691.100 | 2.357 |
| 244.000 | 320 • 898 | 55-490 | 13680.706 | 1.422 |
| 254 • 000 | 343·047 365·193 | 55•864 55•971 | 13675.500 | •485 |
| 264.000 | 387.342 | 55•871 55•509 | 13675.319 | 452 |
| 274.000 | 409.497 | 55•509 54•780 | 13680•200 13690•245 | -1.388 |
| 284.000 | 431-664 | 53.682 | | -2.324 |
| 294.000 | 453.847 | 52.217 | 13705•400 13725•506 | -3.258 -4.190 |
| 304-000 | 476.050 | 50.381 | 13750 • 700 | 5.119 |
| 314.000 | 498.279 | 48.178 | 13780.737 | -6.045 |
| 316.000 | 502.728 | 47.693 | 13787.300 | -6.229 |
| 318.000 | 507+179 | 47-193 | 13794-106 | -6.413 |
| 320.000 | 511.630 | 46.678 | 13801.100 | -6.598 |
| 322.000 | 516.083 | 46+149 | 13808.231 | -6.782 |
| 324.000 | 520.538 | 45.605 | 13815.500 | -6.966 |
| 326.000 | 524,993 | 45.046 | 13822,994 | -7. 150 |
| 328,000 | 529,450 | 44,472 | 13830,600 | -7.334 |
| 330,000 | 533,908 | 43,894 | 13838,425 | -7.517 -7.700 |
| 332,000 | 530,368 | 43,280 | 13846 300 | -7,700 |
| 330.000 332.000 334.000 336.000 338.000 340.000 342.000 344.000 | 533 908 538 368 542 829 547 292 551 756 | 42,662 | 13854 381 | - 7_883 |
| 338,000 | 561 784 | 42.030 | 13862 500 13870 781 | -8 _066 |
| 340 000 | 554 150 EEA 202 | 41,382 | 13010 000 | _8 249 |
| 342 000 | 556 222 560 689 565 157 | 40.719 | 13879 000 13887 456 | _8,431 |
| 344 000 | 565 1E7 | 40.042 | 1300/ 730 | _8,613 |
| 346.000 | 569.627 | 39,350 38.644 | 13895 700 13904 131 | -8,796 |
| 3.55000 | 3071021 | 200044 | 121040121 | _8.978 |

| TABLE | 7. | (CONTID) |
|-------|----|----------|
|-------|----|----------|

- Charles

Birmet.

- Kentaker

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| | TA | BLE 7. (CON | T''D) | |
|--------------------|--|--------------------|--|-------------------------------|
| TIME | RANGE | (001) | 1 D) | |
| FROM | | | | |
| LAUNCH | FROM Launch | 44.000 | | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| 348.000 | (NMI) | (NMI) | (FT/SEC) | |
| | 574.098 | 37.922 | 13912,300 | (DEG) |
| 350.000 | 578,570 | 37,186 | 13920,600 | -9.159 |
| 352,000 | 583.044 | 36,435 | 13928 300 | -9,341 |
| 354.000 | 587,519 | 35,669 | 13928 300 | -9,522 |
| 356,000 | 591,994 | 34,888 | 13936 312 | -9.703 |
| 358,000 | 596,471 | 34,093 | 13943 400 | -9 884 |
| 358 000 360 000 | 600,948 | 33, 283 | 13950 725 | -10.065 |
| 305,000 | 605,426 | 32,459 | 13956 600 | _10.065 _10.245 |
| 364,000 | 609 903 | 31,620 | 13962 744 | -10,425 |
| 366,000 | 614,380 | | 13966 700 | -10,606 |
| 368 ეიე | 618,857 | 30,766 | 13970_667 | -10.787 |
| 370,000 | 623,332 | 29,899 | 133/1 200 | -10,966 |
| 372,000 | 627 806 | 29.017 | 133/1 100 | -11,147 |
| 374 000 | 627.806 632.376 | 28,121 | 13363 500 | _11,327 |
| 376,000 | 632,276 | 27,211 | 13963 600 | -11,507 |
| 378 000 | 636.742 641.203 | 26,287 | 13733,700 | .11 687 |
| 380.000 | 645 676 | 25,350 | 13939 300 | 11 868 |
| 382,000 | 645 656 650 099 | 24,400 | 13917 800 | -12,049 |
| 384.000 | 650,099 | 23 438 | 13887 200 | |
| | 654.529 | 22.464 | 13844.700 | -12,231 |
| 386.000 | 658.941 | 21 • 479 | 13786.400 | _12.414 |
| 388.000 | 663+329 | 20•485 | 12707.200 | -12.598 |
| 390.000 | 667,686 | 19,483 | 13600 400 | *12•783 |
| 392,000 | 667,686 672,001 676,261 | 18,476 | 13600.400 13457.300 13266.400 13013.100 | -12,971 |
| 394.000 | 676,261 | 17,467 | 13266 400 | _13_161 |
| 396,000 | 680,449 684,542 688,516 692,340 695,983 699,411 702,594 705,507 708,132 710,463 712,510 714,291 | 16,460 | 13013 100 | -13,356 |
| 398,000 | 684,542 | 15,461 | 12686 900 | _13,557 |
| 400,000 | 688 516 | 14,475 | 12686 900 | -13,765 |
| 402,000 | 692 340 | 13,511 | 11764 BOO | -13,983 |
| 404.000 | 695 983 | 12,576 | 11/54 000 | -14,214 |
| 406,000 | 699,411 | 11,681 | 11120,000 | -14,463 |
| 408,000 | 702 594 | 10.833 | 10434,200 | -14,734 |
| 410,000 | 705°507 | 10.832 | 12274 700 11764 800 11150 800 10434 200 9628 900 8754 600 7843 300 | -15,034 |
| 415 AUD | 708 132 | 10,03 9 | 7043 300 | -15,370 |
| 747.UUU | 710,463 | 9,306 8,437 | 7843 300 1004 500 | _15 370 _15 752 _16 191 |
| 410 000 | 712.510 | 8,637 | 6936,500 | -16,191 |
| 410,000 | 714,291 | 8.032 | 6072,600 | -10 \ (00 |
| 720.000 | 715 820 | 7.487 | 5278,800 | -17.290 |
| 766,000 | 717 183 | 6,998 | 4566,100 | -17.978 |
| 464.000 | 715 830 717 153 718 287 719 257 | 6,558 | 6936 500 6072 600 5278 800 4566 100 3934 300 3387 100 | -10,110 |
| 769.000 | 710 257 | 6,162 | 3387 100 | -19,710 |
| 428,000 | 720 000 | 5.804 | | -20,792 |
| 430,000 | 120.089 | 5,477 | 2527 700 | -55.038 |
| 432.000 | 720.803 | 5,178 | 2195 860 | -23,467 |
| | 721,418 | 4,900 | 1916 100 | _25_092 |
| | | | • | A 9 3 - F |

TABLE 7. (CONT'D)

| FOOM | RANGE | | | |
|-------------|-----------|---|---------------------|------------------|
| FROM | FROM | | | 8474 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 434.000 | 721.949 | | 1-17-507 | (DEG) |
| 436,000 | 722,410 | 4.641 4.397 | 1685.700 | -26.924 |
| 438 000 | 722 812 | 4 164 | 1494,700 | -28,965 |
| 440.000 | 723,165 | 4,164 | 1336 100 | _31 213 |
| 442,000 | 723,475 | 3,940 | 1205 900 | _33 656 |
| 444.000 | 723.752 | 3,723 | 1101 900 | 36, 271 |
| 446.000 | | 3.510 | 1030.400 | _39.005 |
| 448.000 | 724.004 | 3+295 | 982.000 | -41.790 |
| 450 • 900 | 724 • 235 | 3•078 | 948.900 | -44.569 |
| 453-000 | 724.449 | 2.857 | 925.900 | |
| 452.000 | 724 • 648 | 2.630 | 909.800 | -47 • 297 |
| 454 • 000 | 724•835 | 2.398 | 898.500 | -49.945 |
| 456 • 000 | 725.009 | 2 • 161 | 890 400 | -52.493 |
| 458 • 000 | 725 • 172 | 1.918 | 890.400 | -54.926 |
| 460.000 | 725.324 | 1.671 | 884.600 | -57-238 |
| 452.000 | 725.466 | 1.420 | 880.200 | -59.427 |
| 464.000 | 725.599 | | 876.8 ₀₀ | -61.491 |
| 466 • 0 n n | 725.724 | 1.164 | 874-000 | -63.434 |
| 468-000 | 725.839 | • 905 | 871.200 | -65.259 |
| 470.000 | 725.947 | •644 | 867.000 | -66.973 |
| 472.000 | | • 380 | 861.500 | -68.583 |
| 472-874 | 726 • 047 | •116 | 854.700 | -70.096 |
| +12+0/4 | 726•087 | 0.000 | 851.304 | -70.729 |
| | | • | | 10.153 |
| | | | | |

TABLE 8. TRAJECTORY SD8.4°

A Contract

The same

1

1-14-15097

And the first

Butter ...

| TIME | RANGE | | | |
|--------------------------|----------------|-------------------|----------|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90.000 |
| 4.000 | 0.000 | .024 | 85,000 | 90.000 |
| 6.000 | 0.000 | 061 | 135 800 | 90.000 |
| 8,000 | 0.000 | 114 | 188 300 | 90.000 |
| 6 000 8 000 10 000 | .008 | 184 | 243 400 | 90 000 79 732 |
| 15.000 | •026 | 272 | 301.100 | 77.003 |
| 14.000 | • 054 | •377 | 361.500 | 74.239 |
| 16.000 | • 092 | •501 | 424.900 | 71.476 |
| 18.000 | •143 | •643 | 491.000 | 68.736 |
| 20.000 | •210 | •802 | 560.800 | 66.042 |
| 22.000 | •294 | ∍98 0 | 633.400 | 63.409 |
| 24.000 | •397 | 1 • 1 7 5 | 709.700 | 60.840 |
| 26.000 | •522 | 1.388 | 789.700 | 58.353 |
| 28.000 | •670 | 1.617 | 873.400 | 55.952 |
| 30.000 | •844 | 1.864 | 960.600 | 53.637 |
| 32.000 | 1.046 | 2 • 126 | 1048.500 | 51.405 |
| 34.000 | 1.275 | 2.403 | 1139.200 | 49.261 |
| 36.000 | 1.535 | 2•694 | 1231•9no | 47.198 |
| 38.000 | 1 • 8 2 6 | 2•998 | 1327.400 | 45.212 |
| 40.000 | 2.150 | 3•314 | 1426.400 | 43.302 |
| 42.000 | 2.509 | 3.642 | 1529.200 | 41.468 |
| 44.000 46.000 | 2.904 | 3•98 ₀ | 1635.700 | 39.708 |
| 48.000 | 3.337 | 4.329 | 1746.900 | 38.021 |
| 50.000 | 3.810 | 4.689 | 1862.500 | 36.405 |
| 52.000 | 4.323 | 5.057 | 1983,100 | 34.859 |
| 54.000 | 4.879 | 5•435 | 2108.300 | 33•380 |
| 56.000 | 5.480 | 5.821 | 2538.900 | 31.966 |
| 58.000 | 6•128 6•823 | 6.215 | 2375.000 | 30.616 |
| 60.000 | 7.570 | 6.617 | 2517.700 | 29•326 |
| 62.000 | 8.369 | 7.026 | 2666.500 | 28.095 |
| 64.000 | 9.222 | 7.443 | 2822-100 | 26.921 |
| 66.000 | 10.133 | 7.868 | 2984.300 | 25.802 |
| 68.000 | 11.103 | 8•298 | 3153.700 | 24.736 |
| 70.000 | 12 • 134 | 8.736 | 3330.200 | 23.719 |
| 72.000 | 13.229 | 9•180 9•631 | 3514.300 | 22.751 |
| 74.000 | 14.391 | | 3706.200 | 21.829 |
| 76.000 | 15.622 | 10.088 | 3906.200 | 20.952 |
| 78.000 | 16.925 | 10.550 11.019 | 4114.800 | 20.116 |
| 80.000 | 18.302 | 11.019 | 4332.200 | 19.321 |
| 82.000 | 19.757 | 11.474 | 4559.000 | 18.564 |
| 84.000 | 21.293 | 12.461 | 4795.500 | 17.844 |
| | L. V. L. / U | 154401 | 5042.300 | 17.160 |

TABLE 8. (CONT'D)

| | 1.12 | THO . (COM1 | ע | |
|----------|----------|--------------------------------------|--|----------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 22.913 | 12.954 | 5299.900 | 16.509 |
| 88,000 | 24,621 | 13,453 | 5568,700 | 15,891 |
| 90,000 | 26,420 | 13.958 | 5849 600 | 15,304 |
| 92,000 | 28,314 | 14,459 | 5849,600 6143,200 | 14,746 |
| 94,000 | 30,307 | 14,469 14,987 15,512 | 6450 400 | 14,217 |
| 96,000 | 32,404 | 15,512 | 6772.000 | 13,715 |
| 98,000 | 34 609 | 16.044 | 7109 000 | 13,240 |
| 100.000 | 36,927 | 16,044 16,584 17,132 17,689 | 7462,600 | 12,790 |
| 102,000 | 39,365 | 17,132 | 7834 100 | 12 365 |
| 104 000 | 41,927 | 17,689 | 8224 900 | 11,963 |
| 106.000 | 44.619 | 18.255 | 8636,800 | 11.584 |
| 108.000 | 47•450 | 18.831 | 9071.800 | 11.227 |
| 110.000 | 50 • 527 | 19.418 | 9532-100 | 10.892 |
| 112.000 | 53.670 | 20.017 | 10025 • 100 | 10.578 |
| 114.000 | 56.981 | 20.630 | 10543.900 | 10.284 |
| 116.000 | 60.463 | 21 • 257 | 11100.700 | 10-234 |
| 118.000 | 64.136 | 21.901 | 11695.800 | 9.757 |
| 120.000 | 68.009 | 22.562 | 12335.400 | 9.523 |
| 122.000 | 72.098 | 23.245 | 13026.200 | 9.308 |
| 124.000 | 76.420 | 23.950 | 13776.700 | 9.112 |
| 545 | | , | | 112 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 70 570 | 04 457 | • | |
| 1234400 | 79.579 | 24.457 | 14077.000 | 8.984 |
| | | | | |
| 126.000 | 80.942 | 24,,673 | 14063,500 | 0 436 |
| 128,000 | 85,476 | 25,383 | | 8,930 |
| 130,000 | 89,998 | 26.077 | 14020.000 13982.100 | 8,750 |
| 132,000 | 94.510 | 26.755 | 13968 600 | 8,569 |
| 134,000 | 99.012 | 27.417 | 13948 600 13918 800 13892 200 13868 200 | 8,387 |
| 136,000 | 103.507 | 28,063 | 13892 200 | 8,204 |
| 138,000 | 107.996 | 28 693 | 13868 200 | 8,020 7,836 |
| 140.000 | 112.477 | 28 693 29 307 | 13846.400 | 7.652 |
| 142.000 | 116.954 | 29.906 | 13826.400 | |
| 144.000 | 121.425 | 30.490 | 13808,100 | 7•466 7•281 |
| 146.000 | 125.891 | 31.058 | 13791.200 | 7.095 |
| 148.000 | 130+354 | 31.611 | 13775.600 | 6.408 |
| 150.000 | 134.812 | 32 • 149 | 13761.100 | 6.721 |
| 152.000 | 139.268 | 32.672 | 13747.600 | 6.534 |
| 154.000 | 143.720 | 33.179 | 13735.000 | 6.347 |
| 156.000 | 148.169 | 33.671 | 13723.200 | 6.159 |
| 158.000 | 152-615 | 34 • 148 | 13712.100 | 5.971 |
| 160.000 | 157.058 | 34.610 | 13701.600 | 5.782 |
| 162.000 | 161.500 | 35 • 057 | 13691.800 | 5.594 |
| 164.000 | 165.939 | 35.489 | 13682.500 | 5.405 |
| | | | | |

TABLE 8. (CONT'D)

THE REAL PROPERTY.

9

C. Paragraph.

Samuel Comments

The state of the s

| TIME | RANGE | | | |
|-------------------------------|-----------|--------------------|---|----------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VEL DATTY | PATH |
| (SEC) | (NMI) | | VELOCITY | ANGLE |
| 166.000 | 170.376 | (NMI) | (FT/SEC) | (DEG) |
| 168.000 | 174.811 | 35.90 ₆ | 13673.700 | 5 . 21 ₆ |
| 170,000 | 179,244 | 36.307 | 13665,400 | 5,026 |
| 170,000 172,000 | 183,675 | 36,694 | 13657 500 | 4,837 |
| 174 AAA | 188,105 | 37,065 | 13650.000 | 4,647 |
| 176,000 | 192,533 | 37,422 | 13643,000 | 4,457 |
| 178,000 | 196,960 | 37,763 | 13030,300 | 4,267 |
| 178 000 180 000 182 000 | 201 385 | 38,090 | 13630 000 | 4,077 |
| 182,000 | 205,809 | 38,401 38,698 | 13624 000 | 3 887 |
| 184,000 186,000 | 210,232 | 38 070 | 13010,300 | 3,696 |
| 186,000 | 214,654 | 38,979 | 13613,000 | 3,505 |
| 188 000 | 217 075 | 39,246 | 13607,900 | 3,315 |
| 190,000 | 223,495 | 39,497 | 13603,200 | 3,124 |
| 188,000 190,000 192,000 | 227,914 | 39,734 39,955 | 13624 000 13618 300 13613 000 13607 900 13603 200 13598 700 13594 500 | 2,933 |
| 174.000 | 232.332 | 40.162 | 13594,500 | 2.741 |
| 196.000 | 236.749 | 40.353 | | 2.550 |
| 198-000 | 241 • 165 | 40.530 | 13586.900 | 2.359 |
| 200.000 | 245.581 | 40 • 691 | 13583.500 | 2•167 |
| 202.000 | 249.996 | 40.838 | 13580 • 400 | 1.976 |
| 204.000 | 254.410 | 40.970 | 13577.500 | 1.784 |
| 206•000 | 258 • 824 | 41.086 | 13574.800 | 1.593 |
| 208.000 | 263 • 237 | 41 • 188 | 13572 • 400 | 1 • 4 0 1 |
| 210.000 | 267.650 | 41.275 | 13570-212 | 1.509 |
| 212.000 | 272.062 | 41.347 | 13568.200 | 1.017 |
| 214.000 | 276.474 | 41.404 | 13566.481 | •825 |
| 216.000 | 280.885 | 41.445 | 13565.000 | •633 |
| 218.000 | 285.297 | 41.472 | 13563.706 | •441 |
| 220.000 | 289.708 | 41.484 | 13562.600 | •249 |
| 222.000 | 294.118 | 41.481 | 13561.750 | • 057 |
| 224.000 | 298.529 | 41.463 | 13561.100 13580.500 | 135 |
| 226.000 | 302.938 | 41.429 | 13560.400 | *•327 |
| 228.000 | 307.349 | 41.383 | 13560.350 | 519 |
| 230.000 | 311.759 | 41.320 | 13560.500 | 711 |
| 232.000 | 316.169 | 41.242 | 13560.869 | -•9 ₀₃ |
| 234.000 | 320•579 | 41 • 149 | 13561.400 | -1.095 |
| 236.000 | 324.989 | 41.041 | 13562.162 | -1.287 |
| 238.000 | 329.400 | 40.919 | 13563.100 | -1.479 |
| 240.000 | 333.810 | 40.781 | 13564.212 | -1.671 |
| 242.000 | 338.220 | 40.628 | 13565.500 | -1.863 -2.055 |
| 244.000 | 342.630 | 40.460 | 13567.000 | ~2 • 055 |
| 246.000 | 347.041 | 40.278 | 13568.600 | *2.247 |
| 248.000 | 351,452 | 40.080 | 13570,419 | -2.439 -2.631 |
| 250,000 | 355,862 | 39 868 | 13572,400 | -2.823 |
| | | • | • • • • • • • • | , 053 |

TABLE 8. (CONT'D)

| TIME | RANGE | | | |
|--------------------|--------------------|----------------------|------------------------|--------------------|
| FROM | FROM | | | MATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 252.000 | 360.273 | 39.640 | 13574.512 | -3,014 |
| 254,000 | 364,685 | 39,398 | 13576,700 | -3,206 |
| 256 000 | 369 097 | 39 141 | 13579 100 | _3 398 |
| 256 000 258 000 | 373.508 | 38.868 | 13581,600 | -3.589 |
| 260.000 | 377.920 | 38+581 | 13584 • 219 | *3.781 |
| 262.000 | 382.333 | 38,279 | 13586.900 | -3,972 |
| 264,000 | 386,746 | 37,962 | 13589 787 | _4_163 |
| 266,000 | 391,158 | 37,629 | 13592,600 | _4_355 |
| 268,000 | 395,571 | 37,282 | 13595,594 | -4.546 |
| 270,000 | 399, 985 | 36,920 | 13598,600 | _4 737 |
| 272,000 | 404,399 | 36,543 | 13601 644 | -4 _928 |
| 274,000 | 408,812 | 36,151 | 13604 500 | -5,119 |
| 276,000 | 415 276 | 35,744 | 13607,550 | _5_310 |
| 278,000 | 41/,040 | 35,322 | 13610,400 | _5,501 |
| 280,000 | 422,054 | 34,885 | 13613,281 | -5,692 |
| 282,000 | 426,468 | 34,433 | 13615,800 | -5,882 |
| 284,000 | 430,882 | 33,966 | 13618,450 | -6,072 |
| 286,000 | 435,296 | 33,485 | 13620,500 | -6,263 |
| 288,000 | 439,710 | 32,988 | 13622,669 | -6,454 |
| 290,000 | 444,122 | 32,477 | 13624,000 | -6,644 |
| 292,000 294,000 | 448,535 452,946 | 31,951 31,409 | 13625 319 13625 500 | -6,834 7,025 |
| 295.000 | 457.358 | 30.853 | 13625.600 | -7.025 -7.215 |
| 298.000 | 461.766 | 30.583 | 13624.100 | -7.405 |
| 300.000 | 466-173 | 29.698 | 13622 • 400 | -7.597 |
| 302.000 | 470.579 | 29.097 | 13618.700 | -7.786 |
| 304,000 | 474.981 | 28,483 | 13613,900 | -7,977 |
| 306,000 | 479.381 | 27.854 | 13607.400 | _8.167 |
| 308.000 | 483•777 | 27.210 | 13598.700 | -8.358 |
| 310.000 | 488.169 | 26.552 | 13587.500 | -8.549 |
| 312,000 | 492 • 555 | 25 • 881 | 13573 • 100 | -8.741 |
| 314.000 | 496.934 | 25 • 1 95 | 13555.000 | -8.932 |
| 316.000 | 501 • 305 | 24 • 4 9 5 | 13532.000 | -9.125 |
| 318.000 | 505.667 | 23.782 | 13502.900 | -9.318 |
| 320.000 | 510.016 | 23.056 | 13465.300 | -9.511 |
| 322.000 | 514.351 | 22.317 | 13420,500 | -9.706 |
| 324.000 | 518+667 522+961 | 21.567 | 13363-100 | -9.902 |
| 326.000 | 527·228 | 20.805 | 13291 • 400 | -10·100 |
| 328·000 330·000 | 531 • 461 | 20 • 033 19 • 251 | 13201.800 | -10·299 -10·502 |
| 332.000 | 535.651 | 18.463 | 12950.900 | -10.707 |
| 334.000 | 539.790 | 17.668 | 12777.700 | -10.917 |
| 336.000 | 543.864 | 16,871 | 12561.400 | -11.132 |
| 000 | | | * C = " A V : UV | - 4 - 4 - 6 |

TABLE 8. (CONT'D)

| TIME | RANGE | | | |
|--|--|----------------|------------------------|--|
| FROM | FROM | | | 0474 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 338.000 | | 16.073 | (FT/SEC) | (DEG) |
| 340,000 | 547·859 551.758 | 15.278 | 12297.700 | -11.353 |
| 342,000 | 555 544 | 14,490 | 11980.200 | -11,583 |
| 344,000 | 555,544 559,196 | 13,715 | 11602 400 11158 900 | -11,824 |
| 346.000 | 562.692 | 12.955 | 10647.600 | _11 824 _12 077 _12 347 |
| 348.000 | 566-011 | 12.217 | • | |
| 350.000 | 569 • 132 | 11.506 | 10070.600 | -12-637 |
| 352,000 | 572.037 | 10.827 | 9434.300 8743.500 | *12.951 |
| 354,000 | 574 712 | 10,184 | 8016 300 | -13,295 |
| 356,000 | 577 140 | 9.580 | 7276,400 | _13 676 _14 101 |
| 358 000 | 579 346 | 9.017 | 6546 900 | -14,101 14,570 |
| 360,000 | 579 346 581 312 | 8,495 | 5848 400 | _14 579 _15 120 |
| 362,000 | 583,059 | 8,012 | 5194 800 | -15,120 |
| 364,000 | 584,602 | 7 567 | 5194 800 4593 800 | -15,732 |
| 366,000 | 585 959 | 7,567 7,156 | 4045 900 | -16,429 |
| 368,000 | 587,147 | 6,777 | 4045,900 3556,000 | -17,222 |
| 370 000 372 000 374 000 | 588,186 | 6,427 | 3124 700 | _18 125 |
| 372,000 | 589,092 | 6 101 | 3124 700 2747 600 | -19,152 20,318 |
| 374 000 | 589,883 | 6 101 5 798 | 2416 100 | _20 318 |
| 376 000 378 000 | 590,573 | 5*514 | 2130"500 | .21 638 23 125 |
| 3/8,000 | | 5 246 | 1884 500 | 23 125 24 793 |
| 380,000 | 591,702 | 4,993 | 1678 100 | 26 648 |
| 382,000 | 592,165 | 4,750 | 1503°700 | _26 648 _28 692 |
| 380 000 382 000 384 000 386 000 | 592,572 | 4,517 | 1355 900 | _30,922 _33,328 _35,891 _38,575 |
| 386,000 | 592,932 | 4,291 | 1232 300 | 33, 358 |
| 200,000 | 593,251 | 4.070 | 1129 600 | _35 BQ1 |
| 390 000 | 593,536 | 3 854 | 1053 800 | 38 575 |
| 392,000 | 593,795 | 3 637 | 1001 300 | _30 575 _41 320 |
| 374,000 | 594,032 | 3,418 | 965 100 | |
| 396,000 | 591 702 591 702 592 165 592 572 592 932 593 251 593 536 593 795 594 032 594 252 594 456 594 647 | 3,195 | 939 700 | _46 779 _49 417 |
| 340 000 | 594,456 | 2,967 | 921°700 | _49°417 |
| 400,000 | 594,647 | 2,734 | 908 800 | _51 962 |
| 421.296 | 596.042 | 0.000 | 854,515 | -71.991 |
| | | | | |

TABLE 9. TRAJECTORY SD8.80

| TIME | RANGE | | | |
|----------------------|------------------------|----------------|---|---|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90,000 |
| 4.000 | 0.000 | ,024 | 85,000 135,800 188,300 243,400 | 90,000 |
| 6,000 | 0,000 | .061 | 135,800 | 90,000 |
| 8,000 | 0.000 | .114 | 188 300 | 90,000 |
| 10.000 | .009 | .184 | 243,400 | 90,000 79,244 |
| 12.000 | .028 | 272 | 301 300 361 900 | 76 389 |
| 14.000 | 056 | .377 | 361,900 | 76 389 73 501 |
| 16,000 | 096 | 500 | 425,500 | 10,010 |
| 18 000 | 150 | ,641 | 492,000 | A7 760 |
| 20.000 | .219 | .800 | 562 200 635 400 | 64.956 |
| 22 000 24 000 | 307 | 976 | 635,400 | 64 956 62 221 59 557 |
| 26.000 | .415 .545 | 1.170 | 712 [*] 300 793.000 | 62 [°] 221 59 [°] 557 56 [°] 983 |
| 28.000 | | 1.380 | 793.000 | |
| 30.000 | •700 | 1.607 | 877.500 | 54.502 |
| 32.000 | •881 | 1.851 | 965.500 | 52 • 114 |
| 34.000 | 1 • 0 9 1 1 • 3 2 9 | 2•109 | 1054.200 | 49.817 |
| 36.000 | 1.599 | 2.380 | 1145.700 | 47.613 |
| 38.000 | 1.901 | 2•665 2•962 | 1239.300 | 45.496 |
| 40.000 | 2.237 | 3.270 | 1335.700 | 43.460 |
| 42-000 | 2.609 | 3•588 | 1435.800 1539.400 | 41.507 |
| 44-000 | 3=017 | 3.916 | 1646.800 | 39.633 |
| 46.000 | 3.464 | 4:253 | 1758.900 | 37.837 |
| 48.000 | 3.952 | 4.598 | 1975.300 | 36.118 34.473 |
| 50.000 | 4•481 | 4.952 | 1996.600 | 32.401 |
| 52•000 | 5 • 054 | 5.312 | 2122.500 | 31.399 |
| 54.000 | 5.672 | 5.679 | 2253.600 | 29.964 |
| 56 _{•000} | 6.337 | 6•053 | 2390.000 | 28.594 |
| 58.000 | 7.051 | 6.432 | 2532.400 | 27.287 |
| 60.000 | 7.816 | 6.817 | 2681.400 | 26.040 |
| 62.000 | 8.633 | 7.207 | 2836.600 | 24.851 |
| 64.000 | 9.506 | 7.602 | 2998.300 | 23.718 |
| 66.000 | 10•436 | 8.001 | 3165.900 | 22.639 |
| 68.000 | 11.425 | 8-404 | 3342.500 | 21.610 |
| 70.000 | 12.476 | 8.811 | 3525.500 | 20.631 |
| 72.000 | 13.590 | 9.555 | 3716.000 | 19.698 |
| 74.000 | 14.771 | 9.636 | 3914.300 | 18.810 |
| 76.000 | 16.021 | 10.053 | 4120.900 | 17.965 |
| 78 • 000 80 • 000 | 17.342 | 10.472 | 4336 • 100 | 17.160 |
| 82.000 | 18.737 | 10.895 | 4560 • 200 | 16.395 |
| 84.000 | 20.209 | 11.320 | 4793.800 | 1'5.666 |
| J | 21.762 | 11.747 | 5037.400 | 1 >+ 973 |

TABLE 9. (CONT'D)

A Section

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| | | PLD 3. (COMI | <i>D</i>) | |
|------------------|------------------|------------------|------------------------|--------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 86.000 | 23.398 | 12.176 | | (DEG) |
| 88.000 | 25,120 | | 5291,300 | 14,314 |
| 90,000 | | 12,608 | 5556,300 | 13,688 |
| 92,000 | 26,933 | 13,042 | 5832,900 | 13,093 |
| 94.000 | 28,839 30.844 | 13.478 13.916 | 6121,800 | 12,527 |
| | = | | 6423.900 | 11.991 |
| 96•000 98•000 | 32.951 | 14+357 | 6740.000 | 11.482 |
| | 35·164 | 14.799 | 7071-200 | 10.999 |
| 100.000 | 37·490 | 15-245 | 7418-500 | 10.542 |
| 102.000 | 39.932 | 15-693 | 7783.100 | 10.110 |
| 104.000 | 42•497 | 16-144 | 8166.500 | 9.701 |
| 106.000 | 45-191 | 16.599 | 9570 - 400 | 9.316 |
| 108.000 | 48.020 | 17.058 | 8996.700 | 8.952 |
| 110.000 | 51 • 096 | 17.521 | 9447.500 | 8.611 |
| 112.000 | 54 • 233 | 17.989 | 9925.600 | 8.290 |
| 114.000 | 57.532 | 18.463 | 10434.300 | 7•990 |
| 116.000 | 61.003 | 18.944 | 10976.500 | 7.710 |
| 118.000 | 64 • 657 | 19.433 | 11564.700 | 7•450 |
| 120.000 | 68.515 | 19.932 | 12188.300 | 7.210 |
| 122.000 | 72.577 | 20.441 | 12867.200 | 6.988 |
| 124.000 | 76•877 | 20•963 | 13602• ⁹ 00 | 6•787 |
| BUDALAUT | OF STAGE | | | |
| BURNAUUI | UP STAGE | 1 AT | | |
| 125.400 | 00 015 | 21 225 | 10000 444 | |
| 1230400 | 80.015 | 21.335 | 13892.400 | 6,655 |
| | | | | |
| 126.000 | 01 2/0 | 21 / 22 | 105/3 144 | |
| | 81.369 | 21.493 | 13867.100 | 6.600 |
| 128.000 | 85.861 | 22.009 | 13783.500 | 6.413 |
| 130.000 | 90.330 | 22.507 | 13710.500 | 6.224 |
| 132.000 | 94.777 | 22.988 | 13646.300 | 6.033 |
| 134.000 | 99.205 | 23 • 451 | 13589 • 400 | 5.841 |
| 136-000 | 103-617 | 23+898 | 13538.600 | 5.648 |
| 138.000 | 108.014 | 24.328 | 13493.000 | 5.453 |
| 140.000 | 112.398 | 24.742 | 13451.500 | 5.258 |
| 142.000 | 116.770 | 25 • 1 4 0 | 13414.600 | 5.061 |
| 144.000 | 121 • 131 | 25 • 521 | 13380.500 | 4.863 |
| 146.000 | 125.482 | 25.887 | 13349.300 | 4.665 |
| 148.000 | 129.825 | 26.536 | 13320 • 400 | 4.466 |
| 150.000 | 134 • 159 | 26.570 | 13293.600 | 4.266 |
| 152.000 | 138.485 | 26.887 | 13268.700 | 4.065 |
| 154.000 | 142.804 | 27 • 189 | 13245.400 | 3.864 |
| 156.000 | 147.117 | 27.475 | 13223.600 | 3.662 |
| 158.000 | 151 • 423 | 27.745 | 13203.200 | 3•459 |
| 160.000 | 155.724 | 27•999 | 13184 • 100 | 3.256 |
| 162.000 | 160 • 019 | 28•238 | 13166.000 | 3.053 |
| 164.000 | 164•309 | 28 • 461 | 13148.900 | 2.849 |
| | | | - | |

TABLE 9. (CONT'D)

| | • | 3. (COM | 1 0) | |
|------------------------|--------------------|------------------|----------------------------|-----------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 166.000 | 168-594 | 28 • 668 | | (DFG) |
| 168,000 | 172.874 | 28.860 | 13132.700 | 2.645 |
| 170 000 | 177,150 | | 13117,300 | 2,440 2,235 |
| 170,000 172,000 | 181.421 | 29,036 | 13102,700 | 2,235 |
| 174.000 | 185.688 | 29.196 | 13088.700 | 2.029 |
| 176.000 | 189.952 | 29.341 | 13075.400 | 1.853 |
| 178.000 | | 29.470 | 13062.600 | 1.617 |
| 170.000 | 194.211 | 29.584 | 13050.400 | 1.410 |
| 180.000 | 198.467 | 29.681 | 13038.600 | 1.203 |
| 182.000 | 202.720 | 29.764 | 13027.300 | .996 |
| 184.000 | 206.559 | 29.831 | 13016.400 | .788 |
| 186.000 | 211.21- | 56.885 | 13005.900 | •581 |
| 188.000 | 215.457 | 29.917 | 12995.700 | •372 |
| 190.000 | 219.696 | 29.937 | 12985.800 | •164 |
| 192.000 | 553.935 | 29.942 | 12976.200 | *•045 |
| 194.000 | 228 • 165 | 29.931 | 12966.900 | 254 |
| 196.000 | 232 • 394 | 29.904 | 12957.700 | 463 |
| 198.000 | 236.621 | 29.862 | 12948.700 | 672 |
| 200.000 | 240.845 | 29.804 | 12939.800 | -,882 |
| 202.000 | 245.066 | 29.731 | 12931 • 100 | -1.092 |
| 204.000 | 249.283 | 29.642 | 12922-400 | -1.302 |
| 206.000 | 253•498 | 29.537 | 12913.700 | 71.512 |
| 208.000 | 257.709 | 29.418 | 12905-100 | -1.723 |
| 210.000 | 261.918 | 29.282 | 12896.400 | -1.934 |
| 212.000 | 266 • 123 | 29 • 131 | 12887.600 | *2 •145 |
| 214.000 | 270 • 325 | 28 • 965 | 12878.700 | 72•356 |
| 216,000 | 274.523 | 28,783 | 12869,600 | -2,567 |
| 218,000 | 278,718 | 28,585 | 12860 200 | -2 779 |
| 218.000 220.000 | 282.910 | 28.372 | 12850.500 | |
| 222.000 | 287.097 | 28+144 | | _2,991 |
| 224.000 | 291 • 281 | 27.900 | 12840.500 | -3.204 |
| 550.000 | 295•461 | 27.640 | 12830 • 000 12818 • 900 | -3.41 6 |
| 228.000 | 299.636 | | | -3.629 |
| 230.000 | 303.806 | 27:366 27:-75 | 12807.200 | -3.842 |
| 232.000 | 307.972 | 27.075 | 12794.600 | -4 • 055 |
| 234 • 000 | | 26.770 | 12781.200 | -4.269 |
| 234+000 | 312.132 | 26.449 | 12766.600 | -4.483 |
| 236 • 000 236 • 000 | 316.287 | 26 • 113 | 12750-900 | ~4 •698 |
| | 320 • 435 | 25 • 762 | 12733-800 | -4.913 |
| 240.000 | 324.577 | 25•395 | 12715 • 000 | -5.129 |
| 242·000 244·000 | 328•711 332•837 | 25.013 | 12694 • 300 | *5•345 |
| 246.000 | | 24.617 | 12671-200 | -5.561 |
| 248-000 | 336.954 | 24 • 205 | 12645.300 | -5.778 |
| 248.000 | 341.061 | 23.779 | 12616.200 | -5.996 |
| 250.000 | 345-157 | 23•337 | 12583.400 | ~6.215 |

TABLE 9. (CONT'D)

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| | TIME | RANGE | | | |
|---|--|--------------------|----------------|------------|--------------------|
| | FROM | FROM | • | | |
| | LAUNCH | LAUNCH | A1 955 | | PATH |
| | (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| | 252.000 | 3.4 3 V | (NMI) | (FT/SEC) | (DEG) |
| | 254.000 | 344.240 | 25.885 | 12546.200 | |
| | 256 000 | 353.310 | 22.412 | 12503,900 | =6.435 |
| | 258 000 | 357,363 | 21,928 | 12455 600 | -6.656 6.470 |
| | 260,000 | 361 398 | 21,430 | 12400 300 | _6.878 _7.102 |
| | 256,000 258,000 260,000 262,000 | 302,413 | 20,919 | 12336 866 | -7,102 |
| | 264.000 | 307,404 | 20,394 | 12263 600 | -7.327 |
| | | 373.368 | 19,857 | 12179.000 | m (JO4 |
| | 266.000 | 377.300 | 19.309 | | _7,784 |
| | 268 • 000 | 381•197 | 18.749 | 12081-100 | -8 •016 |
| | 270.000 272.000 | 385→953 | 18-178 | 11967-400 | *8 • 252 |
| | 274,000 | 388.861 | 17,599 | 11835.500 | -8.491 |
| | 274.000 | 392,613 | 17.011 | 11682,000 | -8,/34 |
| | 276.000 | 396.300 | 16.417 | 11502,100 | -8 ,983 |
| | 278.000 | 399.914 | 15:818 | 11294.900 | -9. 238 |
| | 580.000 | 403.443 | 15.216 | 11057.800 | -9.5 00 |
| | 282•000 | 406.878 | | 10787.700 | -9.771 |
| | 284+000 | 410-205 | 14.613 | 10482-100 | -10.052 |
| | 286•000 | 413.413 | 14.012 | 10139.000 | -10.346 |
| • | 288•000 | 416.489 | 13.416 | 9757.700 | ~10.654 |
| | 290•nnn | 419.421 | 12.826 | 9336.600 | -10-979 |
| | 272•00v | 422-195 | 12.246 | 8875.800 | *11.325 |
| | 294 • 0 n n | 424.801 | 11.679 | 8379.400 | -11.694 |
| | 270.000 | 427:232 | 11.129 | 7853.800 | *12·693 |
| | 298.000 | 429.482 | 10.597 | 7307.600 | -12.524 |
| | 300.000 | 431.551 | 10.086 | 6753.200 | -12.996 |
| | 302.00û | 433•442 | 9.598 | 6201.600 | *13.512 |
| | 304.000 | 435-160 | 9•132 | 5663•300 | -14.082 |
| | 306.000 | 436.713 | 8 • 691 | 5145•5nn | -14.711 |
| 1 | 308.000 | 438-110 | 8 • 272 | 4654.500 | -15-405 |
| | 310.000 | 439.361 | 7.876 | 4191.900 | -16.186 |
| | 312.000 | 440.477 | 7.503 | 3762.800 | -17.051 |
| | 314.000 | 441.471 | 7-149 | 3371 - 100 | -18.015 |
| | 316.000 | 442.354 | 6.816 | 3016.900 | -19.091 |
| | 318,000 | 443,137 | 6 • 499 | 2698.200 | -20.289 |
| | 320,000 | 442 820 | 6.199 | 2410.300 | -21.621 |
| | 322,000 | 443.830 | 5,914 | 2153 100 | -23 102 |
| | 324.000 | 444.442 444.982 | 5,643 | 1925,400 | -23,102 -24,743 |
| | 326.000 | | 5,383 | 1729,200 | 26.551 |
| | 328.000 | 445.461 | 5•133 | 1561.700 | -28.528 |
| | 330.000 | 445.886 | 4 + 8 9 2 | 1416,200 | ~30·672 |
| | 332.000 | 446.264 | 4 * 657 | 1292.200 | *32.977 |
| | 334 • 000 | 446.601 | 4.428 | 1187.000 | -35.4mg |
| | 336.000 | 446.902 | 4.204 | 1099.800 | ~35.428 |
| | 333300 | 447.173 | 4.204 3.981 | 1037.000 | -38.067 -40.670 |
| | | | - ' | - 2 - 200 | -40.670 |

TABLE 9. (CONT'D)

AMERICAN MENTAL PROPERTY OF THE PROPERTY OF TH

| TIME FROM LAUNCH (SEC) 338.000 340.000 342.000 344.000 | RANGE FROM LAUNCH (NMI) 447.421 447.649 447.861 448.058 | ALTITUDE (NMI) 3.758 3.532 3.302 3.068 | VELOCITY (FT/SEC) 992.800 961.600 939.400 923.400 | PATH ANGLE (DEG) -43.362 -46.036 -48.657 -51.198 |
|---|--|---|--|--|
| 340,000 342,000 | 447,649 447,861 | 3,532 3,302 | 992.800 961.600 939.400 | -43.3 ₆ 2 -46.036 |

TABLE 19. TRAJECTORY SD9.20

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| TIME | RANGE | | | |
|--------------------|----------------|----------------|---|------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | A1 777.00 | | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 0.000 | 0.000 | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | 0.500 | 0.000 | 90.000 |
| 4.000 | | •004 | 35,900 | 90.000 |
| 6,000 | 0.000 | .024 | 85_000 | 90,000 |
| 8,000 | 0.000 | .061 | 85 000 135 800 188 300 243 500 | 90,000 |
| 10,000 | 0.000 .009 | .114 | 188 300 | 90.050 |
| 12,000 | .029 | 184 | 243 500 | 78 756 |
| 14.000 | 059 | 271 | 301 200 | 75 775 |
| 16 000 | 100 | 376 | 362,300 | 72 764 |
| 18,000 | .156 | 499 | 426 200 | 72 764 69 759 |
| 20.000 | .229 | .640 | 493,000 | 66,789 |
| 22,000 | | .797 | 563,700 637,400 | 63 878 |
| 24,000 | .321 .433 | .973 | 637,400 | 61 043 |
| 26 000 | | 1,164 | 715 000 | 58 288 |
| 28,000 | .569 .729 | 1,373 | 796 400 | 55 629 |
| 30,000 | ` 010 | 1,597 | 881 800 | 53,072 |
| 32.000 | 1,135 | 1,837 | 970 500 | 50,616 |
| 34 000 | 1,383 | 2.091 | 1060 100 | 48,256 |
| 30,000 | 1,662 | 2,357 | 1152,400 | 45,997 |
| 38 000 | 1 975 | 2,636 | 1246 900 | 43 829 |
| 40.000 | 1 975 2 322 | 2,925 | 1344 100 | 71 : 77 |
| 42.000 | 2.706 | 3,224 | 1445 200 | 39, 755 |
| 44-000 | 3.127 | 3.533 | 1549.700 | 37.845 |
| 46.000 | 3.588 | 3 • 850 | 1658.100 | 36+017 |
| 48.000 | 4 = 090 | 4.175 | 1771.000 | 34.270 |
| 50 - 000 | 4.634 | 4-507 | 1888*500 | 32.599 |
| 52.000 | 5.223 | 46844 | 2010-100 | 31.005 |
| 54.000 | 5.857 | 5.188 | 2136,500 | 29.482 |
| 56.000 | 6.538 | 5.536 | 2268.000 | 28.029 |
| 58.000 | 7•269 | 5.889 | 2404.700 | 26.642 |
| 50•000 | 8.051 | 6.246 | 2546.800 | 25•320 |
| 62.000 | 8.886 | 6•606 6•969 | 2695.600 | 24 • 059 |
| 64• nnn | 9.776 | | 2850.300 | 22.857 |
| 00.00 | 10.723 | 7•335 | 3011-200 | 21.712 |
| 68 • 000 | 11.729 | 7.703 8.272 | 3178.800 | 20.622 |
| 70.000 | 12:797 | 8.072 | 3353.200 | 19.583 |
| 72.000 | 13.928 | 8.442 | 3534.600 | 18.593 |
| 74.000 | 15.124 | 6.614 | 3723.200 | 17.651 |
| 76 . ₀₀ | 16.390 | 9.185 | 3919.300 | 16.754 |
| 78.000 | 17.725 | 9+557 9-028 | 4123.300 | 15.400 |
| 80•000 | 19.134 | 9.929 | 4335.500 | 15.086 |
| 82.000 | 20.620 | 10.300 | 4556.400 | 14.312 |
| 84.000 | 22·184 | 10 • 670 | 6786.100 | 13.575 |
| - 5 0 | 56-104 | 11.039 | 5025.200 | 12.874 |
| | | | | |

TABLE 10. (CONT'D)

| | | | 2) | |
|------------------------|--------------------|------------------|------------------------|----------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| 86.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 88,000 | 23.830 | 11.407 | 5274.200 | 12.207 |
| 90,000 | 25.561 | 11,774 | 5533,700 | 11,572 |
| 92,000 | 27,380 | 12,138 | 5804 200 | 10,969 |
| 94.000 | 29 292 31 299 | 12,501 | 6086 500 | 10,395 |
| 96.000 | 31,299 | 12,861 | 6381,200 | 9 851 |
| 98.000 | 33.406 | 13.219 | 6689.300 | 9.334 |
| | 35.618 | 13.575 | 7011.500 | 8.843 |
| 100 • 000 102 • 000 | 37.938 | 13.929 | 7349.100 | 8.378 |
| 104.000 | 40 • 372 | 14.280 | 7703.000 | 7.937 |
| 106.000 | 42·926 45·604 | 14.629 | 8074.600 | 7.521 |
| 108.000 | 48-414 | 14.976 | 8465.400 | 7.127 |
| 110.000 | 51.467 | 15•321 | 8877.300 | 6 • 755 |
| 112.000 | 54.575 | 15 • 663 | 9312-200 | 6 • 4 0 5 |
| 114.000 | 57.838 | 16.004 | 9772.500 | 6.076 |
| 116.000 | 61.267 | 16•344 16•684 | 10261.200 | 5.768 |
| 118.000 | 64.872 | | 10781-100 | 5.479 |
| 120.000 | 68.667 | 17•022 17•361 | 11336.400 | 5.210 |
| 122.000 | 72.664 | 17.702 | 11932.000 | 4.961 |
| 124.000 | 76.879 | 18.044 | 12573.600 | 4.730 |
| | | 101044 | 13269.500 | 4.519 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 79.953 | 18.285 | 12524 000 | |
| | | 104503 | 13530.900 | 4.381 |
| 126.000 | 01 254 | • • • • • | | |
| | 81.276 | 18.386 | 13477.800 | 4.322 |
| 128,000 | 85.647 | 18.710 19.016 | 13299 200 | 4,123 |
| 130,000 132.000 | 89,963 | 19,016 | 13139 800 | 3 919 |
| 134.000 | 94.231 | 19.302 | 12996.300 | 3.712 |
| 136.000 | 98.455 | 19.570 | 12866.200 | 3.501 |
| 138.000 | 102.638 | 19.819 | 12747.400 | 3.286 |
| 140.990 | 106•786 110•899 | 20.051 | 12638.100 | 3.069 |
| 142.000 | 114.981 | 20.265 | 12537.100 | 2.848 |
| 144 = 000 | 119.035 | 20.461 | 12443.200 | 2.624 |
| 146.000 | 123.060 | 20°640 20•801 | 12355.300 | 2•398 |
| 148,000 | 127.060 | 20.946 | 12272.600 | 2.170 |
| 150.000 | 131 • 035 | 21.073 | 12194.500 | 1.939 |
| 152.000 | 134.987 | 21.183 | 12120 • 200 | 1 • 7 0 5 |
| 154.000 | 138.917 | 21.276 | 12049.300 11981.200 | 1.470 |
| 156.000 | 142.825 | 21.353 | 11915.700 | 1•232 •992 |
| 158.000 | 146.712 | 21.412 | 11852.200 | •751 |
| 160.000 | 150 • 579 | 21.455 | 11790.500 | • 151 • 507 |
| 162.000 | 154.425 | 21.481 | 11730-200 | •261 |
| 164.000 | 158.253 | 21.490 | 11671-100 | •014 |
| | | - • | | 2014 |

TABLE 10. (CONT'D)

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| 77.45 | | (00. | 27 | |
|----------------|---------------------------------|------------------|---|--------------------------------|
| TIME | RANGE | | | |
| FROM Launch | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | AEFOCITA | ANGLE |
| 166.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 168,000 | 162.061 | 21.483 | 11612.900 | |
| 170,000 | 165,850 169,621 | 21,459 | 11555,200 | 23 ₆ 487 |
| 172.000 | 173.372 | 21,418 | 11497 900 | 740 |
| 174.000 | | 21.361 | 11440,600 | 995 |
| 176-000 | 177•105 180•8 ₁ 8 | 21.287 | 11383.200 | *1+252 |
| 178.000 | 184.512 | 21 • 197 | 11325-400 | 71.511 |
| 180,000 | 188.186 | 21.091 | 11266-800 | -1.772 |
| 182 000 | 191 841 | 20.968 20.828 | 11207.300 | -2,035 |
| 184.000 | 195.474 | 20,829 20,673 | 11146 500 11084 100 | 2 299 |
| 186-000 | 199.086 | | | _2.566 |
| 188.000 | 202-677 | 20.502 | 11019.700 | *2.836 |
| 190.000 | 206.244 | 20.315 | 10953 • 100 | -3.107 |
| 192.000 | 209.787 | 20·111 19·892 | 10883.900 | -3.381 |
| 194.000 | 213.306 | 19.657 | 10811.500 | ~ 3•657 |
| 196.000 | 216.798 | 19.407 | 10735.500 | -3.936 |
| 198.000 | 250.565 | 19.141 | 10655.500 10570.700 | -4.218 |
| 200.000 | 223.696 | 18 • 861 | 10480-600 | -4.503 |
| 202.000 | 227.099 | 18.565 | 10384.500 | -4 • 79 ₁ |
| 204.000 | 230 • 468 | 18•255 | 10281.500 | *5•083 |
| 206.000 | 233.801 | 17.931 | 10170.900 | "5•378 "5•678 |
| 208.000 | 237•095 | 17.593 | 10050 • 100 | -5.98 2 |
| 210.000 | 240•347 | 17.242 | 9919.300 | -6.292 |
| 212.000 | 243.552 | 16.877 | 9777.900 | -6.607 |
| 214.000 | 246 • 709 | 16.501 | 9624.800 | -6. 928 |
| 216.000 | 249.811 | 16.113 | 9458.900 | -7.256 |
| 218.000 | 252 • 855 | 15•715 | 9279.000 | - 7.592 |
| 220.000 | 255 • 837 | 15.307 | 9084.000 | -7.937 |
| 222.000 | 258.750 | 14.890 | 8872.700 | -8.291 |
| 224 • 000 | 261.590 | 14:465 | 8644.200 | -8,657 |
| 226.000 | 264 • 350 | 14.033 | 8397.7 ₀₀ | - 9•035 |
| 530.000 | 267•026 269,609 | 13.597 | 8132.800 | -9.427 |
| 232,000 | | 13.157 | 7849,200 | -9,835 |
| 234.000 | 272,096 274,478 | 12.715 12.273 | 7547 300 | _10_262 |
| 236.000 | 276.753 | 12,273 | 7547,300 7228,200 6893,300 | -10,709 |
| 238.000 | 278.914 | 11.831 | ~ · · · · · · · · · · · · · · · · · · · | -11.181 |
| 240.000 | 230.957 | 11.393 | 6544.900 | -11.679 |
| 242.000 | 282.881 | 10.960 | 6186.000 | -12.208 |
| 244.000 | 284.682 | 10.533 | 5820.400 | -12.772 |
| 246 • 0 n n | 286+362 | 10•113 9•703 | 5452.300 | -13.376 |
| 248 • 000 | 287.922 | 9.703 | 5084.900 | -14.024 |
| 250 • 000 | 289•362 | 8•913 | 4722.400 | -14.723 |
| | E 0 2 . J 0 E | 0.412 | 4366•400 | -15.479 |

TABLE 10. (CONT'D)

| | | • | (001.1 | |
|--|--------------------|---|--|---|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 252.000 | 290,686 | 8.535 | .026.500 | -16.299 |
| 254.000 | 291,897 | 8.170 | 3689.000 | -17,191 |
| 256,000 | 293,002 | 7.818 | 3375 300 | |
| 228,000 | 294,006 | 7.477 | 3080 800 | _18_163 _19_225 |
| 260,000 | 294 915 | 7 818 7 477 7 150 6 834 6 530 | 3689.000 3375.300 3080.800 2806.800 | 20 385 |
| 262,000 | 295 736 | 6 834 | 2551,100 | 21 652 |
| 264,000 | 296,475 297,138 | 6.530 | 2314 500 2097 500 | 21,652 |
| 266,000 | 297 138 | 6,237 | 2097 500 | -23 038 |
| 268 000 | 297 731 | 5 956 | 1899 200 | -24 553 26 207 |
| 270,000 | 298 260 298 733 | 5 956 5 685 5 423 | 1723 300 | 26 207 |
| 272,000 | 298,733 | 5 423 | 1570 200 | _28,007 |
| 274,000 | 299,156 | 5 168 | 1434 800 | _29 [*] 955 |
| 276,000 | 299,534 | 4,921 | 1899 200 1723 300 1570 200 1434 800 1317 009 | _32 048 |
| 278 000 | 299 873 | 4 680 | 1215 501 | _34 282 |
| 280 000 | 300 177 | 4'443 | 1128 400 | 39 110 |
| 282 000 | 300,451 | 4 443 4 210 3 978 3 744 | 1317 069 1215 503 1128 400 1060 900 1012 700 978 200 953 400 | 36 644 39 119 |
| 284 000 | 300,700 | 3 978 | 1012 700 | _41 678 _44 272 _46 858 |
| 286,000 | 300,929 | 3 744 | 978 200 | 44,616 |
| 288 000 | 301,140 | 3,508 | 963 600 | _46_858 _49_398 |
| 290,000 | 301,337 | 3,268 | 635°300 | #7,370 51 H47 |
| 292,000 | 301.521 | 3.023 | 935 300 922 000 912 100 904 400 | _51 867 _54 246 _56 523 _58 691 _60 747 |
| 294.000 | 301,692 | 2.775 | 912 100 | -34,240 |
| 746 000 | 301.852 | 2,523 | 215°100 | -30,323 |
| 298 000 | 302,001 | 2,266 | 898 400 | 60 747 |
| 300,000 | 302,141 | 2.007 | 893,500 | _62_692 _64_525 _66_251 _67_873 |
| 302,000 | 302,271 | 1.744 | 889 300 | 44 525 |
| 304 000 | 302,393 | 1.478 | 885 500 | 46 251 |
| 306 000 | 302,506 | 1,210 | 882 100 | 47 673 |
| 298 000 300 000 302 000 304 000 306 000 308 000 | 302,612 | .940 | 878.700 | -69.396 |
| 310,000 | 302.710 | .669 | | |
| 312,000 | 302.801 | 397 | 875,200 869,900 | -70,823 |
| 314,000 | 302,885 | .124 | 863,000 | _72,162 73,419 |
| 314.907 | 302.921 | 0.000 | 859 . 371 | _73,418 |
| = • • • | -021,51 | 0.000 | 027.3/1 | -73 ,963 |

TABLE 11. TRAJECTORY SD9.40

Shaller .

Parameter 1

-

| TIME | RANGE | | | |
|--|----------------|----------------|---|---|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | •004 | 35.900 | 90.000 |
| 4.000 | 0.000 | .024 | 85,000 | 90,000 |
| 6.000 | 0.000 | .061 | 85,000 135,800 188,300 243,500 | 90,000 |
| 8,000 | 0,000 | . 114 | 188 300 | 90,000 |
| 10,000 12,000 | 0 9 9 | 184 271 | 243 500 | /H 517 |
| 12,000 | 030 | ,271 | 301 600 | 75 460 |
| 14,000 | .060 | .316 | | 72 396 69 332 66 306 |
| 16,000 | 103 | 499 | 426 600 493 500 564 500 638 500 716 400 | 69,332 |
| 18,000 | .160 | 639 | 493,500 | 66,306 |
| 20,000 | .234 | 796 | 564,500 | 63,342 |
| 22,000 | .327 | .971 | 638,500 | 60,458 |
| 24,000 | .442 | 1,162 | 716,400 | 47 ASQ |
| 26,000 | ,580 | 1,369 | 798 200 883 900 | 54,959 |
| 28 000 30 000 32 000 34 000 36 000 40 000 42 000 44 000 | ,744 | 1,592 | 883,900 | 54,959 52,365 |
| 32 000 | , 936 1 157 | 1,830 | 973 000 | 47,010 |
| 34 000 | 1.157 | 2.081 | 1063,000 | |
| 36 000 | 1.409 1.693 | 2,345 | 1155°700 | 45,201 |
| 38 000 | 2,011 | 2,621 | 1250 700 | 43 ⁰ 009 40 ⁹ 08 |
| 40 000 | 2.011 2.364 | 2,906 | 1348 400 | 40,908 |
| 42 000 | 2,754 | 3,201 | 1450 000 | 38 895 |
| 44.000 | 3,181 | 3 505 | 1554 900 | 36 968 |
| 46,000 | 3,649 | 3,817 | 1663 700 | 35 126 |
| 48,000 | 4.157 | 4,135 | 1777 000 | 33,365 |
| 50,000 | 4.709 | 4,460 4,790 | 1894,600 | 31,684 |
| 52,000 | 5 305 | 5.125 | 2016 800 2143 400 | 30,079 28,547 |
| 54,000 | 5.946 | 5.464 | 2275 100 | 27 085 |
| 56,000 | 6,636 | 5.807 | 2411,900 | 27,085 25,692 |
| 56 000 58 000 60 000 | 7 375 | 6 152 | 2554 000 | 24 363 |
| 60,000 | 8,165 | 6,500 | 2702.400 | 23 096 |
| 62,000 | 9 008 | 6 850 | 2856 900 | 21,888 |
| 64,000 | 9,906 | 7,201 | 3017,300 | 20,738 |
| 66,000 | 10,861 | 7,553 | 3184,300 | 19,642 |
| 68,000 | 11,875 | 7,906 | 3357.800 | 18,599 |
| 70.000 | 12,950 | 8,258 | 3538 300 | 17,605 |
| 72,000 | 14,088 | 8,610 | 3725 600 | 16,658 |
| 74.000 | 15,292 | 8,961 | 3920 600 | 15,756 |
| 76.000 | 16,563 | 9,311 | 4123,100 | 14 898 |
| 78:000 | 17.905 | 9,659 | 4333.700 | 14.080 |
| 80.000 | 19.320 | 10.005 | 4552.400 | 13.302 |
| 82.000 | 50.810 | 160348 | 4779.800 | 12.261 |
| 84.000 | 22.378 | 10.689 | 5016,300 | 11.455 |

TABLE 11. (CONT'D)

| | 2. | with the following | MII'D) | |
|--|--|--|-------------------------------------|---|
| TIME | RANGE | | , | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | AEFOCILA | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 86.000 | 24.027 | 11.027 | (FT/SEC) | (DEG) |
| 88,000 | 25,760 | 11,361 | \$2 ₆ 2,300 | 11.184 |
| 90,000 | 27 580 | 11,301 | 5518,400 | 10,546 |
| 92,000 | 27,580 29,491 | 11,691 | 5785,200 | 9 938 |
| 94,000 | 31 407 | 12,018 | 6063 200 | 9 360 |
| 96,000 | 33 601 35 807 | 12,341 | 6353 200 | 8 811 |
| 98 000 | 35 807 | 12,659 | 6656 000 | 8 290 |
| 100 000 | 38 120 | 12,972 | 6972,500 | 7 195 |
| 102,000 | 38 120 40 545 | 13,281 | 7393 500 | 7 325 |
| 104,000 | 43,004 | 13,585 | 7650,300 | 6 880 |
| 106,000 | 45 750 | 13.884 | 8013 800 | 6 458 |
| 108,000 | 48 542 | 14,179 | 8395,600 | 6,059 |
| 110,000 | 51 574 | 14,408 | 8797 300 | 6 059 5 683 |
| 112,000 | 54 684 | 14,752 | 9220,800 | 5 327 |
| 114.000 | 43 086 45 750 48 542 51 574 54 656 | 14-179 14-468 14-752 15-031 15-306 | 9668 200 | 4 993 |
| 116.000 | 31,090 | 15,306 | 10142,300 | 4,679 |
| 118.000 | 61.285 | 13,310 | 10645 500 | 4 385 |
| 120.000 | 64.850 | 15,842 | 11181 600 | 4,110 |
| 122.000 | 68,597 | 16,104 | 11755,000 | 3,855 |
| 124,000 | 72,539 | 16,362 | 12370_800 | 3,618 |
| **** | 76,691 | 16,618 | 13035,700 | 3.400 |
| BURN-OUT | OF STARF | | • | |
| DOMNEOUT | OF STAGE | 1 AT | | |
| 125.400 | 79.716 | 14 705 | | |
| | 154114 | 16.795 | 13276,200 | 3.257 |
| | | | | |
| 126.000 | 81.012 | 14 040 | **** | |
| 128.000 | | 16.868 | 13191,100 | 3.196 |
| 130.000 | 85.282 | 17.100 | 12925,000 | 2.988 |
| 132 000 | 89,470 | 17,312 | 12684 700 | 2 773 |
| 132.000 134.000 | 93,584 | 17,312 17,504 17,677 | 12467,800 | 2 551 |
| 136,000 | 97,630 | 17,677 | 12269 000 | 2,324 |
| 138 000 | 101,615 | 17,832 | 12085 300 | 2,091 |
| 138,000 | 105.541 | 17,968 | 11914,300 | 1,852 |
| 140.000 | 109.414 | 18.085 | 11/24/100 | 1,608 |
| 142.000 144.000 146.000 148.000 | 113,237 | 18, 185 18, 267 18, 331 18, 377 | 11603 000 11459 600 | 1 359 |
| 146 000 | 117 011 120 740 | 18,267 | 11459 600 | 1 106 |
| 148 000 | 120.740 | 18,331 | 11322 700 11191 300 | 848 |
| 150,000 | 124,426 | 18,377 | 11191 300 | 585 |
| 150,000 152,000 | 150 068 | 18,406 | 11088 500 | 318 |
| 154 000 | 131.071 | 18,406 18,417 18,412 | 10941 500 10821 400 | 046 |
| 154.000 | 135,234 | 18,412 | 10821 400 | • |
| 156,000 | 138,757 | 18.383 | 10703 800 | -,230 -,510 |
| 158.000 | 142.243 | 18,349 | 10703 300 10587 900 10473 200 | 795 |
| 160,000 | 145,690 | 18,585 | 10473 200 | 1 084 |
| 160 000 162 000 164 000 | 149,100 | 18,292 18,219 | 10359 100 10245 100 | 1,377 |
| 104,000 | 152,472 | 18,128 | 10245 100 | -1,675 |
| | | - | • • • | |

TABLE 11. (CONT'D)

Section !

Hobsteiner I

Mattheway and Street

June . . .

Tourse B

Constant

Topmost 7

| | 77 | | | | |
|---|--|---|----------------------------|--|--|
| | TIME | RANGE | | | |
| | FROM | FROM | | | |
| | LAUNCH | LAUNCH | AL TITUDE | | PATH |
| | (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| | 166.000 | 1 | (NMI) | (FT/SEC) | (DEG) |
| | 168,000 | 155.806 159,102 162,359 165,577 168,753 171,888 174,979 | 18.055 | 10130.600 | #1 00-0 |
| | 170,000 | 137,105 | 17,898 | 10014,900 | *1 + 978 |
| | 172,000 | 162,359 | 17 750 | 9896 100 | -2,285 |
| | 174 600 | 165,577 | 17 603 17 432 17 245 | 9775 100 | 2,597 2,914 3,236 3,564 3,898 |
| | 174 000 176 000 | 168,753 | 17 432 | 9651 300 | -2,914 |
| | 170,000 | 171,888 | 17 245 | 9651 200 | -3,236 |
| | 1,07000 | 174 979 | 17 042 | 9523 800 | -3 564 |
| | 100.000 | 178.026 | 17.042 | 9392 700 | -3 898 |
| | 182.000 | 181.026 | 16.824 | 9257.200 | -4.237 |
| | 184•0čŏ | 192-020 | 16.592 | 9116.800 | -4.584 |
| | 186,000 | 183-979 | 16.345 | 8970.800 | 74.004 |
| | 188,000 | 186,882 | 16.084 | 8818,700 | 4.937 |
| | 190 000 | 164,135 | 15,809 | 8659 70C | -5,298 |
| | 190,000 | 189,732 192,528 195,266 197,945 200,560 203,109 | 15 521 | 8493 200 | -5 ,666 |
| | 192,000 | 195.266 | 15,221 | 9319 700 | -6.044 |
| | 194.000 | 197,945 | 14,908 | 8318 700 | _6_430 |
| | 130,000 | 200 560 | 14 584 | 8135 300 | -6 827 |
| | 148 000 | 203 109 | 14,584 | 1742 (00 | -7.235 |
| | 200,000 | | 14 250 | 7740 200 | -6 044 -6 430 -6 827 -7 235 -7 655 |
| | 194.000 196.000 198.000 200.000 202.000 204.000 206.000 208.000 210.000 212.000 | 207 994 | 13,906 | 7740 200 7527 400 | 8 088 |
| | 204 000 | 210 204 | 13,553 | 7304 lnn | 8 536 |
| | 206 000 | 212.573 214.738 216.816 | 13,192 | 7070 100 | -9,000 |
| | 208 200 | 214 720 | 12,825 | 6825 60A | -9,483 |
| | 210 000 | 214,730 | 12,452 | 4570 744 | 9 005 |
| | 212 000 | 510,810 | 12,076 | 6306 300 6033 100 5752 400 | 9 985 |
| | 214 000 | E10*002 | 11,696 | 6033 100 | -10,510 |
| | 214.000 | 220,700 | 11,314 | 5753 400 | -11.060 |
| | 210,000 | 222.501 | 10,932 | 3/32,400 | -11,638 |
| | 216,000 218,000 220,000 222,000 | 224,205 | 10 551 | 3465 300 5173 500 | -12,247 |
| | 220,000 | 225,810 | 10.551 | 5173,500 | -12.891 |
| | 222.000 | 227.318 | 10,173 | 4879 700 | _13 574 |
| | 224.000 | 228.727 | 9.798 | 4585.600 | _14.301 |
| | 226•00ŏ | 230.039 | 9•428 | 4292.200 | -15.077 |
| | 228,000 | 531 354 | 9.063 | 4002.500 | 13-0// |
| | 230 000 | 231,256 | 8.706 | 3719,600 | -15.908 |
| | 232 000 234 000 236 000 238 000 | 232,379 | 8,356 | 3446 144 | -16,799 |
| | 234 000 | 233,412 | 8,014 | 3183 800 | -17,759 |
| | 236 000 | 233,412 234,360 | 7.680 | 3183 800 2934 200 2697 600 | _17 759 _18 794 _19 911 |
| | 230 000 | 235,226 | 7,356 | 2607 600 | -19,911 |
| | 230,000 | 236,014 | 7 041 | 2091 000 | -61.119 |
| | 6 T V . 111111 | 236,729 | 7.041 | 24/3,300 | -22,426 |
| | 242 BAB | 237,376 | 6.735 | 2697 600 2473 300 2263 200 2067 400 1886 100 1722 300 1577 300 | -23,842 |
| i | 244.000 | 237,958 | 6,439 | 2067,400 | -25,375 |
| i | 246,000 | 238 401 | 6,152 | 1886 100 | -27.035 |
| i | 244 000 246 000 248 000 250 000 | 238,481 | 5,874 | 1722 300 | 28 420 |
| 2 | 250 000 | 238 952 239 374 | 5,605 | 1577 300 | -28 828 |
| • | | C57, 374 | 5 343 | 1447.800 | -30 756 |
| | | | ▼ - | - 747, 500 | -32 817 |
| | | | | | |

TABLE 11. (CONT'D)

| TIME FROM | RANGE | | | |
|--------------------|--------------------|--------------------|----------------------|--------------------------|
| LAUNCH | FROM Launch | AL TYTUSE | | PATH |
| (SEC) | (NMI) | ALTITUDE (NMI) | VELOCITY (FT/SEC) | ANGLE |
| 252.000 254.000 | 239.753 240.093 | 5•088 | 1222.700 | (DEG) |
| 256,000 | 240.400 | 4.839 4.595 | 1234,300 | -35.007 -37,316 |
| 258,000 | 240,675 | 4,355 | 1147 900 1077 300 | -39,729 |
| 260,000 262,000 | 240,926 241,156 | 4,117 | 1026 300 | -42,224 -44,759 |
| 264,000 | 241,368 | 3,879 3,638 | 989 400 962 800 | -47,292 |
| 266 000 268 000 | 241,565 | 3 3 9 5 | 943 300 | _49 785 _52 212 |
| 270,000 | 241,749 241,920 | 3,148 2,897 | 928 800 | -74,754 |
| 272.000 | 242.080 | 2.642 | 917 900 909.600 | _56 798 _58 938 |
| 274.000 276.000 | 242•229 242•368 | 2.384 | 902.900 | -60.969 |
| 278.000 | 242.498 | 2•122 1.858 | 897.500 892.800 | -62.891 |
| 282,000 | 242,619 | 1,591 | 888 700 | -64.705 -66.413 |
| 284,000 | 242 732 242 837 | 1,322 1,051 | 884 900 | _68 019 |
| 286,000 | 242,935 | 778 | 881 300 877 800 | _69 527 _70 942 |
| 288,000 290,000 | 243,026 243,110 | .505 | 873 300 | - 72 . 268 |
| 291,686 | 243,176 | .231 0.000 | 867 000 860 557 | -73,512 |
| | • | - 4000 | 200,001 | -74.501 |

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Saletine at

A Anches Min.

A comment

| TIME | RANGE | | J. C. ODJ. C | |
|--|--------|----------------|--|--|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TITUDE | | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 0.000 | 0.000 | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 4,000 | 0.000 | •004 | 35,900 | 90.000 |
| 6.000 | 0.000 | .024 | 85,000 135,800 | 90,000 |
| 8,000 | 0.000 | .061 | 135,800 | 90,000 |
| 10,000 | .010 | .114 | 188 300 | 90.000 |
| 12,000 | | 184 | 243 600 | 78 025 |
| 14.000 | ^^< | .271 | 301,800 | 74 857 |
| 16,000 | 107 | .376 | 362,900 | 71,661 |
| 18,000 | 166 | 498 | 427 300 | 68 480 |
| 20,000 | 243 | 637 | 494 600 | 65,343 |
| 22.000 | .340 | .794 | 566 100 | 62 275 |
| 24,000 | 459 | .967 | 640 600 719 200 | 59 296 |
| 26.000 | 603 | 1,156 | 719,200 | 56 408 |
| 28.000 | •773 | 1.361 | 801.700 | 53,631 |
| 30.000 | •972 | 1.581 | 888.300 | 50.967 |
| 32.000 | 1.201 | 1.815 | 978.200 | 48.414 |
| 34.000 | 1.461 | 2.062 | 1069-100 | 45.969 |
| 36.000 | 1.755 | 2.350 | 1162.600 | 43.633 |
| 38.000 | 5.085 | 2.590 | 1258.400 | 41.397 |
| 40.000 | 2.446 | 2.868 | 1357.000 | 39.256 |
| 42.000 | 2.847 | 3.155 | 1459.600 | 37.208 |
| 44.000 | 3.287 | 3.449 | 1565.300 | 35 • 251 |
| 46,000 | 3.767 | 3.749 | 1675.000 | 33.381 |
| 48.000 | 4.289 | 4.055 | 1789,100 | 31 507 |
| 50,000 | 4,855 | 4.366 | 1907,300 | 29 894 28 271 26 722 25 247 23 840 |
| 32 NAA | 5,465 | 4.681 4.999 | 2030 200 | 28 271 |
| 54,000 | 6,121 | 4,999 5,319 | 2157,200 | 26,722 |
| 56,000 | 6.826 | 5,317 | 2289, 200 | 25 247 |
| 58,000 | 7,579 | 5.641 5.964 | 2426 000 | 23 840 |
| 60,000 | 8 384 | 6.288 | 2568 000 | 22 499 21 221 |
| 54 000 56 000 58 000 60 000 62 000 | 9 242 | 6,611 | 2715 400 | 21,221 |
| 94,000 | 10.155 | 6,934 | 2869 300 | 20.004 |
| 66.000 | 11,125 | 7,255 | 3028,500 | 18.844 17.739 |
| 68,000 | 12,153 | 7,574 | 3194.000 | 17,739 |
| 68 000 70 000 | 13,241 | 7.891 | 3365 800 | 16,687 15,684 |
| 12.000 | 14,392 | 8,205 | 3544 100 3728 900 | 15,684 |
| 74.000 | 15,607 | 8.515 | 3728 900 | 14.729 |
| 76.000 | 16,890 | 8.821 | 3920 700 | 13.819 |
| 76 000 78 000 80 000 | 18,241 | 9,123 | 4112,000 | 12,953 |
| 80.000 | 19,664 | 9 419 | 4520 VVV | 12,127 |
| 02,000 | 21,160 | 9.419 9.710 | 4762,000 | 11,341 |
| 84 000 | 22,732 | 9 995 | 4119 600 4326 000 4540 000 4762 000 4992 300 | 10,591 |
| | • | • • • • • • | 4335 200 | 9 878 |
| | | | | |

| TABLE 12. | (CONTID) |
|-----------|----------|
|-----------|----------|

| | T. | BLE 12. (CO | NT'D) | |
|--|-------------------------------|--------------------------------------|----------------------------------|--|
| TIME | RANGE | (00) | | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TETHOR | | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 86.000 | 24.383 | (NMI) | (FT/SEC) | (DEG) |
| 88,000 | 26,116 | 10.274 | 5231.200 | 9.198 |
| | 27 922 | 10,546 | 5479,200 | 8,550 |
| 92 000 | 27 ⁹ 33 | 10,810 | 5736 700 | 7 934 |
| 94 000 | 29 [°] 837 | 11,067 | 6004 [*] 3nn | 7,347 |
| 90,000 92,000 94,000 96,000 98,000 100,000 102,000 | 31,832 | 10 810 11 067 11,316 | 6282 600 6572 200 | 6 788 |
| 98 000 | 33,922 | 11,556 | 6572 200 | 6 257 |
| 100,000 | 36,108 | 11,787 | 6873 700 | 6,257 5,751 |
| 102 000 | 38,397 | 12,009 | 7188 000 | 5 751 |
| 104 000 106 000 108 000 110 000 112 000 | 40.791 | 12,222 | 7515 900 | 5,271 |
| 106 000 | 43,295 | 12,424 | 7857 700 | 4,815 |
| 108°000 | 45,914 | 12,617 | 8215 100 | 4 382 3 971 |
| 110 000 | 48 653 | 12 617 12 799 12 970 | 8586 800 | |
| 112 000 | 51,622 | 12,970 | 8980 200 | 3 582 3 214 |
| 114,000 | 54,630 | 13,130 | 9390 800 | 3,814 |
| 116.000 | 57,775 | 13,279 | 9822,300 | 2.866 |
| | 61,067 | 13,416 | 10276,500 | 2,538 |
| 118,000 120,000 | 64,512 | 13,542 | 10754 300 | 2,229 |
| 155,000 | 68,118 | 13,656 | 11259 500 | 1,938 |
| 124,000 | 71,895 | 13,757 | 11793 900 | 1.666 |
| 124,000 | 75 852 | 13,847 | 12361 200 | 1,411 |
| RiiDx:_Aur | ** *** | V | | 1,174 |
| 100-2200 | OF STAGE | 1 A7 | | |
| 125.400 | 20 20 | | | |
| 24.400 | 78.718 | 13.902 | 12517.100 | 1 03 9 |
| | | | | 1.017 |
| 126.000 | 20.0.5 | | | |
| 128.000 | 79.942 | 13.923 | 12358,200 | 040 |
| 130.000 | 83.903 | 13.981 | 11821.900 | .949 |
| 132 000 | 87,698 | 14,020 | 11336 200 | •713 |
| 132,000 | 91.340 | 14,041 | 10891 900 | .460 |
| 134 000 136 000 | 94.843 | 14,044 | 10481 900 | .191 |
| 138 000 | 98,216 | 14.030 | 10100 500 | - 093 |
| 138,000 | 101.468 | 13.999 | 9743 300 | 392 |
| 140.000 | 104 505 | 13,951 13,887 13,807 13,711 | 9404 900 | 707 |
| 144 000 | 107 635 110 560 113 384 | 13,887 | 9404 900 9081 500 | |
| 144.000 146.000 | 110,560 | 13,807 | 8771 °500 | -1.382 |
| 148 000 | 113,384 | 13,711 | 8472 600 | -1,745 |
| 148,000 | 110 115 | 13,601 | 8183,400 | -2,120 |
| 150,000 | 110,/46 | 13,475 | 7902.600 | -6,513 |
| 152,000 | 151.588 | 13,335 | 7628 900 | -2,924 |
| 154,000 | 121 288 123 741 | 13,182 | 7361.400 | -1 382 -1 743 -2 120 -2 513 -2 924 -3 352 |
| 156,000 | 126,106 | 13,014 | 7099 300 | , , , , |
| 158,000 | 128,385 | 12,834 | 6841 700 | m4.264 |
| 160,000 | 126,106 128,385 130,578 | 12,642 | 6588 200 | -4 750 -5 256 |
| 162,000 | 132.688 134.715 | 12,437 | 6841 700 6588 200 6338 200 | ~2,£36 |
| 164,000 | 134,715 | 12,221 | 6091,400 | -5,785 |
| | | _ | | .6.337 |
| | | 51 | | |

TABLE 12. (CONT'D)

A water that A

President

| | 1.2 | ирит 13. (СО | MT'D) | |
|--|--|---------------|--|--|
| TIME | RANGE | | , | |
| FROM | FROM | • | | |
| LAUNCH | LAUNCH | ALTITUDE | WELDOLD. | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 166.000 | 135.660 | 11.995 | (FT/SEC) | (DEG) |
| 168.000 | 136.660 138.523 | 11.758 | 5847.400 | -6.914 |
| 170,000 | 140 306 | 11,512 | 5605,900 | -7.517 |
| . A/E_UUU | 142,009 | 11,258 | 2390,200 | _8_149 |
| 4/4,000 | 140.306 142.009 143.632 145.177 146.643 148.031 149.342 150.576 151.739 152.827 | 10.995 | 5366 500 5129 000 4893 900 4660 800 4429 600 | _8 149 _8 811 |
| 1,0,00 | 145,177 | 10,726 | 4643, 700 | 0 5 4 4 |
| 1,0,000 | 146,643 | 10,456 | 4420,44 | 10.236 11.004 |
| 100,000 | 148 031 | 10,169 | 4761 832 | _11 004 |
| 182 000 | 149 342 | 9,884 | 4201,000 3975,800 3754,900 | _ 1 1 12 14 |
| 104,000 | 150 578 | 9,596 | 3775,000 | 12,569 13,572 14,528 15,542 |
| 100,000 | 151,739 | 9,305 | 3539,100 | .13,572 |
| 100,000 | | 9,012 | 3339,300 | .14,528 |
| 190.000 | 153,845 | 8,718 | 3329,200 | -15,542 |
| 175,000 | 154,795 | 8,423 | 3125,500 | w 3 W . C 1 C |
| 194.000 | 155,678 | 8,130 | 2928,700 | -17,760 |
| 196.000 | 156,496 | 7,837 | 2738 800 | .18,975 |
| *********** | 157,253 | 7,547 | 2333 VIII 2378 AAA | -20,268 |
| | 155,678 156,496 157,253 157,950 | 7,260 | 2555.000 2378.600 2210.500 | .17.750 .18.975 .20.268 .21.546 |
| ~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | 158 589 | 6,976 | 2050,400 | -23,115 |
| ~V ~ _UUU | 159,175 | 6,697 | 1899,100 | 23,115 24,681 |
| 206.000 | 157 *50 158 *589 159 *175 159 *709 160 *195 160 *637 | 6,421 | 1758 700 | ~£0,351 |
| 208,000 | 160,195 | 6,151 | | -28,130 |
| 210,000 | 160,637 | 5,885 | 1629 800 1511 200 1402 600 1305 700 1219 800 1143 800 1080 000 | -30,018 |
| 000,515 | ****** | 5,623 | 1402 600 | 32,018 |
| 214,000 | 161,401 | 5,366 | 1305 700 | 34,127 |
| 218 000 | 161,730 | 5,114 | 1219 800 | -36,340 |
| 218,000 220.000 | 162.029 | * ,865 | 1143 800 | •38,546 •1.033 |
| 555.000 | 162.299 | 4-619 | 1080.000 | -41.032 -43.478 |
| 224.000 | 162.545 | 4.375 | 1032.500 | -45.95] |
| 556.000 | 162-772 | 4-130 | 997.200 | ~48.412 |
| 558.000 | 162.981 | 3.884 | 971.300 | #50-K3 |
| 230.000 | 163.176 | 3.634 | 952.000 | ~50.831 ~53.183 |
| 232 * 000 | 1630357 | 3•382 | 43/o4nn | - 55•452 |
| 234.000 | 163.526 | 3.156 | 926.2nn | -57.626 |
| 236.000 | 163.683 | 2.857 | 91/2400 | ~59.700 |
| 238.000 | 163.830 | 2.605 | 910.300 | -61.669 |
| 240.000 | 163.968 | 2.339 | ^Q 04.énn | *63.533 |
| 242.000 | 164.096 | 2.072 | 899.200 | °65.294 |
| 244.000 | 164.215 | 1.805 | 89 %.6 66 | -66.953 |
| 240.000 | 164·326 164·430 | 1.530 | 690.40n | *68.535 |
| 248.0 0 0 | 164.526 | 1 • 256 | 850.400 | ≈69.98 ₁ |
| 250.000 | 194.918 | *982 | 862°200 | -71.358 |
| €5€•U00 | 164.638 | ۰70 ē | 878,800 | ~72,649 |
| 254.000 | 164.776 | °430 | 275.H00 | ~770859 |
| 255 119 | 164 816 | , 15¢ | 867,100 | ~74,394 |
| 7 | · · · · · · · · · · · · · · · · · · | 0,000 | 862,626 | "75°598 |
| | | | | TW T |

TABLE 13. TRAJECTORY T2N.10

| TIME | RANGE | | | |
|---|----------------|-----------|--|------------------|
| FROM Launch | FROM | | | PATH |
| | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.900 |
| 2.000 | 0.000 | .004 | 35.900 | 90.000 |
| 4.000 | 0.000 | .024 | 85 000 | 90.000 |
| 6.000 | 0.000 | .061 | 85,000 135,800 188,300 243,000 299,800 | 90.000 |
| 10.000 | 0.000 | .114 | 188 300 | 90,000 |
| 12.000 | 005 | 185 | 243 000 | 90 000 84 128 |
| 14 000 | 015 | 273 | 299 800 | 82,554 |
| 14,000 | .031 | 380 | 358 900 420 400 | 80 949 |
| 18 000 | .053 | .507 | 420,400 | 79 329 |
| 20.000 | .082 | ,653 | 484 000 | 77, 706 |
| 8.000 10.000 12.000 14.000 16.000 18.000 20.000 | ,121 | .818 | 484 000 550 600 | 76,091 |
| | .170 | 1,004 | 619,300 | 74,494 |
| 26 000 | .230 | 1,211 | 041,000 | 72,914 |
| 28 000 | .304 | 1,439 | 765 600 | 71 363 |
| 000.05 | .392 | 1,689 | 843 300 | 69 843 |
| 24 000 26 000 28 000 30 000 32 000 | .496 | 1,961 | 765 600 843 300 924 000 | 68,357 |
| 32,000 | .617 | 2,254 | 1005 600 1089 200 1174 500 | 66 904 |
| 34.000 36.000 | 756 | 2,569 | 1089 200 | 65 488 |
| 38.000 | .914 | 2.907 | 1174.500 | 64.106 |
| 40.000 | 1 • 0 9 3 | 3 • 2 6 5 | 1262.100 | 62.758 |
| 42.000 | 1 • 295 | 3 • 6 4 5 | 1352 - 400 | 61.444 |
| 44.000 | 1.519 | 4.047 | 1447.100 | 60-166 |
| 46.000 | 1 • 768 | 4.472 | 1544.900 | 58.922 |
| 48.000 | 2.044 | 4.918 | 1647.300 | 57.717 |
| 50.000 | 2.347 | 5•389 | 1754.500 | 56.548 |
| 52.000 | 2.680 | 5.882 | 1866.800 | 55.418 |
| 54.000 | 3.044 | 6.401 | 1984.600 | 54.326 |
| 56.000 | 3•441 3•873 | 6.544 | 2108.400 | 53.272 |
| 58.000 | | 7.513 | 2238.500 | 52.256 |
| 60.000 | 4•341 4•849 | 8.110 | 2375.200 | 51.279 |
| \$2.000 | 5.397 | 8.734 | 2518.700 | 50.340 |
| 64.000 | 5.989 | 9.386 | 2669.400 | 49.437 |
| 66.000 | 6.625 | 10.069 | 2827.300 | 48,572 |
| 68.000 | 7.310 | 10.782 | 2992.800 | 47.715 |
| 70.000 | 8.047 | 11.527 | 3165.900 | 46.835 |
| 72.000 | 8.837 | 12.303 | 3347.100 | 45,938 |
| 74.000 | 9.686 | 13.110 | 3536.500 | 45.033 |
| 76.000 | 10.595 | 13.950 | 3734.400 | 44.121 |
| 78.000 | 11.568 | 14,822 | 3941 • 100 | 43.204 |
| 80.000 | 12.610 | 15.726 | 4156.800 | 42.282 |
| 82.000 | 13.722 | 16.663 | 4381,900 | 41.350 |
| 84 000 | 14.911 | 17.632 | 4616,600 | 40,403 |
| • | | 18,632 | 4861,200 | 39,431 |

TABLE 13. (CONT'D)

| TIME | RANGE | | | |
|----------------------------|---------------|----------------------------|--|-------------------------------|
| FROM | FROM | | | PATH |
| LAUNCH | JAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (JMN) | (%%[) | (FT/SEC) | (DEG) |
| 86.000 | 16.180 | 19.664 | 5116.100 | |
| 88.000 | 17,533 | 20.725 | 5381.300 | 38•422 37 _• 365 |
| 90,000 | 18,976 | 21,813 | 5657 100 | 36 243 |
| 92,000 | 20,515 | 22,925 | 5381,300 5657,100 5943,600 | 35 038 |
| 90.000 92.000 94.000 | 22,156 | 24 058 | 6240 300 6546 000 | 33,727 |
| 30,000 | 23,904 | 25,204 | 6546 000 | 32 287 |
| 98,000 | 25,768 | 26,357 | 6859 700 | 30,693 |
| 100,000 | 27,752 | 27,506 | 6546,000 6859,700 7179,500 7502,300 7824,200 8139,300 8439,500 | 28,931 |
| 102,000 | 29,864 | 28,638 | 7502 300 | 26,970 |
| 104,000 | 32,109 | 28,638 29,740 30,792 | 7824 200 | 24, 793 |
| 106,000 | 34,489 | 30,792 | 8139,300 | 22,372 |
| 108 000 | 37,006 | 31,771 | 8439 500 | 19 684 |
| 110,000 | 39,655 | 32,654 | 8715 200 | 16,712 |
| 112,000 | 42,429 | 33,413 | 8715 200 8969 400 9238 800 | 13,500 |
| 114,000 | 45,322 | 34,028 | 9238 800 | 10,198 |
| 116.000 | 48.335 | 34.484 | 9529.000 | 6.814 |
| 118.000 | 51.571 | 34.766 | 9843.000 | 3.339 |
| 120.000 | 54.831 | 34 • 856 | 10184.800 | 232 |
| 122.000 | 58.208 | 34.732 | 10559.000 | -3.911 |
| 124.000 | 61•698 | 34•374 | 10994 • 100 | -7.630 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 64.207 | 33.992 | 11189.700 | -9.136 |
| 126.000 | 65,288 | 33.815 | 11101 500 | 0.014 |
| 128,000 | 68,889 | | 11191.500 | -9,216 |
| 130.000 | 72.491 | 33.217 32.602 | 11198.500 11205.587 | -9.475 |
| 132.000 | 76.091 | | | •9,733 |
| 134.000 | 79.693 | 31.970 | 11211.900 | -9.991 |
| 136.000 | 83.293 | 31•321 30•656 | 11218.337 | -10-249 |
| 138.000 | 86.894 | 29.973 | 11223.700 | -10-507 |
| 140.000 | 90.492 | 29.275 | 11229.033 11232.900 | -10.765 |
| 142.000 | 94.090 | 28.560 | 11236.100 | -11.021 -11.278 |
| 144.000 | 97.686 | 27.829 | 11238+100 | -11.534 |
| 146.000 | 101.280 | 27.081 | 11238.400 | -11.79 1 |
| 148.000 | 104.872 | 26.317 | 11236.700 | -12.047 |
| 150.000 | 108.460 | 25.537 | 11232.500 | -12.303 |
| 152.000 | 112.043 | 24.742 | 11224.900 | -12,560 |
| 154.000 | 115.620 | 23.930 | 11212.900 | -12.816 |
| 156.000 | 119•190 | 23 • 10 4 | 11195.200 | -13.073 |
| 158.000 | 122.751 | 22.264 | 11:70.300 | -13.331 |
| 160.000 | 126.299 | 21.409 | 11136.100 | -13.589 |
| 162.000 | 129.831 | 20.541 | 11089.800 | -13,849 |
| 164.000 | 134.343 | 19.662 | 11027.900 | -14-110 |
| | | | | · · |

TABLE 13. (CONT'D)

| TIME | | (60. | | |
|--------------------|--|----------|----------------------------------|--|
| TIME FROM | RANGE | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| 166.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 168 000 | 136.830 | 18.772 | 10945.800 | -14.374 |
| 168.000 | 140.283 | 17.874 | 10837.800 | -14 640 |
| 170,000 | 143,693 | 16,970 | 10837.800 10694.900 | -14.640 -14.911 |
| 172,000 | 147,049 | 16,063 | 10511 500 10279 600 | 15 14 |
| 174.000 | 150,336 | 15,158 | 10279 600 | _15 16¢ |
| 176,000 | 143 693 147 049 150 336 153 536 156 632 | 14,260 | 9990 500 | -15 472 |
| 178 000 | 150,632 | 13,373 | 9635 700 | -15 ,766 |
| 180.000 | 1374600 | 12.506 | 9206.500 | 16 073 |
| 182.000 | 162•417 | 11•665 | 8699.800 | 16.396 |
| 184.000 | 165.058 | 10.859 | 8119.200 | -16.741 |
| 186,000 | 167.503 | 10,095 | 7478,600 | -17.114 |
| 188,000 | 169,736 | 9,378 | 6800 900 | -17.522 |
| 190,000 | 169.736 171.749 173.544 175.128 176.514 177.718 | 8,714 | 6800,900 6111,800 5437,100 | -17,974 |
| 192.000 | 173,544 | 8,103 | 5437 100 | -18 480 |
| 194.000 | 175,128 | 7,545 | 4795 300 | -19,053 |
| 196,600 | 176,514 | 7,038 | 4795 300 4198 300 | -19,705 |
| 198.000 | 177,718 | 6,578 | 3656 500 | -20,450 |
| 200,000 | 1/0 /59 | 6,161 | 3177 700 | -21.307 |
| 202,000 | 179,657 | 5,783 | 2760 800 | 22 291 23 420 |
| 204,000 | 180 430 | 5,437 | 2401 900 | -23,420 |
| 206,000 | 181.096 | 5,120 | 2095 900 | -67 (11 |
| 208,000 | 181,671 | 4.827 | 2095 900 1836 400 | meg. 101 |
| 210.000 | 182.169 | 4.554 | 1622.300 | _27 843 -29 704 |
| 212.000 | 182.601 | 4.297 | 1442.600 | -27.704 |
| 214.000 | 182.978 | 4.053 | 1294 • 000 | -31.765 |
| 216.000 | 183.309 | 3.820 | 1171.500 | -34.022 |
| 218.000 | 183.601 | 3.594 | 1077.500 | -36.459 |
| 220.00 | 183.862 | 3.371 | 1014,400 | -39.049 |
| 222.000 224.000 | 184,100 | 3,148 | 971 600 | -41.729 |
| 224,000 | 184,319 | 2,923 | 942 100 | -44 436 -47 117 -49 735 -52 267 |
| 220,000 | 184,523 | 2,694 | 921 600 | 40 735 |
| 228,000 | 184,712 | 2,460 | 907.000 | 52°267 |
| 230,000 | 184.888 | 2,221 | 896 700 | 54 400 |
| 232.000 | 185.053 | 1.978 | 889 200 | .54 693 .57 005 .59 197 .61 269 |
| 237,000 | 185,207 | 1,731 | 883.700 | -57,005 |
| 236,000 | 185,351 | 1,479 | 879.400 | #33,131 |
| 230,000 | 185.485 | 1,223 | 876.000 | 42 221 |
| 240.000 | 185,611 | .964 | 873,000 | m03 //I |
| Z4Z.000 | 185.728 | •702 | 869.100 | -65.056 |
| 244.000 | 185.837 | •438 | 863.800 | -66.779 |
| 246.000 | 185•977 | •174 | 857.100 | ~68.398 |
| 247.315 | 185.999 | 0.000 | 852 • 138 | -69.920 |
| | | 0 - 000 | 995 + 120 | -70.870 |

TABLE 14. TRAJECTORY T3N.10 (110)

| TIME | RANGE | | 0 (110) | |
|--------------------------------------|----------------|----------------------------|----------------------|--------------------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | A1 777 | | PATH |
| (SEC) | (NM1) | ALTITUDE | VELOCITY | ANGLE |
| 0.000 | 0.000 | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | | 0.000 | 0.000 | 90.000 |
| 4.000 | 0.000 | •004 | 35,900 | 90,000 |
| 6,000 | 0.000 | .024 | 85,000 | 90,000 |
| 8,000 | 0.000 | .061 | 135 800 | 90,000 |
| 10.000 | 0.000 | .114 | 188 300 | 90,000 |
| 12,000 | .005 | ,185 | 243,000 | 84 128 82 554 80 949 79 329 |
| 14,000 | .015 031 | .273 | 299,800 | 82,554 |
| 16,000 | | .380 | 358,900 | 80 949 |
| 18,000 | . J53 | .507 | 420,400 | 79 329 |
| 20,000 | .082 | 653 | 484 000 | 77 706 |
| 22,000 | .121 | .818 | 550,600 | 76,091 |
| 24,000 | .170 | 1.004 | 619 300 | 74 494 |
| 26 000 | .230 | 1,211 | 691,000 | 74 494 72 914 71 363 |
| 28,000 | 304 | 1,439 | 765 600 | 71 363 |
| 30.000 | 392 | 1 689 | 843 300 | 69 873 |
| 32,000 | .496 .617 | 1,961 | 924,000 | 68 357 |
| 34.000 | • | 2,254 | 1005,600 | 66 904 |
| 36.000 | •756 | 2.569 | 1089.200 | 66 904 65 488 |
| 38.000 | •914 | 2.907 | 1174.500 | 51.06 |
| 40.000 | 1.093 | 3.265 | 1262.100 | 26.28 |
| 42.000 | 1.295 | 3.645 | 1352.400 | 61.444 |
| 44.000 | 1•519 1•768 | 4.047 | 1447.100 | 60.166 |
| 46.000 | 2.044 | 4.472 | 1544.900 | 58. 9 22 |
| 48.000 | 2.347 | 4.919 | 1647.300 | 57.717 |
| 50.000 | 2.680 | 5.388 | 1754.500 | 56.548 |
| 52.000 | 3.044 | 5,882 | 1866,800 | 55,418 |
| 54.000 | 3,441 | 6.400 | 1984,500 | 54,325 |
| 56,000 | 3.873 | 6,944 | 2108,300 | 53,272 |
| 58,000 | 4.341 | 7,513 | 2238,500 | 52,256 |
| 60.000 | 4.849 | 8.109 | 2375,200 | 51,279 |
| 62,000 | 5.397 | 8,733 | 2518,700 | 50,339 49,437 48,571 |
| 64,000 | 5.989 | 9,386 | 2669 400 | 49,437 |
| 66 000 | 6.625 | 10.069 | 2827 300 | 48,571 |
| 00.000 | 7.310 | 10.782 11.526 12.302 | 2992 700 | 47 715 46 835 |
| 70,000 | 8.047 | 11,260 | 3165 900 3347 100 | 46 835 |
| 72.000 | 8,837 | 12,302 | 3347 100 | 45 430 |
| / 5 () 0 0 | 9.686 | 13,110 | 3536 500 | 45 032 |
| 76 000 | 10,595 | 13,950 | 3734,400 | 45 032 44 121 |
| 76 000 78 000 80 000 82 000 | 11.568 | 14.821 15.726 | 3941 100 | 43,204 |
| 80 000 | 12,609 | 12,160 | 4156 B00 | 42,232 |
| 82 000 | 13.722 | 16,662 17,631 | 4381 900 | 41,350 |
| 84 000 | 14.911 | 10,433 | 4616,600 | 40,403 |
| • | ****** | 18,632 | 4861 200 | 39 431 |

TABLE 14. (CONT'D)

| TIME | DANAS | | • | |
|--------------------|------------------|------------------|---|--|
| FROM | RANGE | | | |
| LAUNCH | FROM | 41 = 4 = 4 | | PATH |
| | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 16.179 | 19.664 | 5116.100 | 36,422 |
| 88,000 | 17,533 | 20,724 | 5381,300 | 37,365 |
| 90,000 | 18,976 | 21,813 | 5657 100 | 36 243 |
| 92,000 | 20,515 22,155 | 22, /25 | 5943 600 | 35 038 |
| 94.000 | 22,155 | 24.6 | 6240 200 | 33 727 |
| 96,000 | 23,904 | 25 204 | 6546 000 | 32 287 |
| 98,000 | 25,767 | 26,356 | 6859 600 | 30.693 |
| 100,000 | 25.767 27.752 | 27,505 | 177.500 | 35 038 33 727 32 287 30 693 28 931 26 971 24 793 |
| 102,000 | 29,864 | 28,638 | 7502 300 | 26,731 |
| 104.000 | 32,109 | 29,740 | 782 \$ 200 | 24 792 |
| 106.000 | 34,489 | 30,791 | 8139,300 | 22 272 |
| 108,000 | 37,006 | 31,771 | 8439 500 | 22,373 |
| 110,000 | 39 655 | 32,654 | 8732,300 | 19,685 |
| 112,000 | 42,448 | 33,444 | 9130 300 | 16,811 |
| 114,000 | 45,404 | 34,162 | 9597 800 | 14,480 |
| 116,000 | 48 538 | 34,824 | 10131,700 | 12,557 |
| 118,000 | 51,971 | 35,452 | | 11.086 |
| 120,000 | 55 519 | 36 072 | 10727 800 | 10,098 |
| 155.000 | 59, 286 | 36,072 36,715 | 11381 200 | 9,616 9,594 |
| 124,000 | 63 284 | 37,410 | 12084 900 | 9,594 |
| • | · | 0,400 | 12850 600 | 9,072 |
| BURN-OUT | OF STAGE | · AT | | |
| 125.400 | 66,223 | 37.880 | 13161,900 | 8.930 |
| | | | | |
| 126.000 | 67.493 | 20.001 | 15150 500 | |
| 128.000 | 71.724 | 38.081 | 13158.500 | 8.870 |
| | 75 954 | 38.741 | 13147.500 | 8,669 |
| 130 000 132 000 | 80 182 | 39.386 | 13136 950 | 8,468 |
| 134,000 | 84.408 | 40,015 40,628 | 13126 700 | 8,267 |
| 136,000 | 88.632 | 41,020 | 13116,887 | 8,066 |
| 138,000 | 92.854 | 41.227 | 13107,400 | 7.864 |
| 140.000 | 97.075 | 41.809 | 13098,275 | 7,662 |
| 142.000 | 101.294 | 42,376 | 13089 400 | 7,460 |
| 144.000 | 105,512 | 42.928 | I KAMA Y12 | 7,258 |
| 146.000 | 109.728 | 43,464 | 130/2, 100 | 7,055 |
| 148,000 | 113,944 | 43,985 | 13064.800 | 6,852 |
| 150,000 | 118,158 | 44.490 | 13057,100 | 6,649 |
| 152,000 | 122,370 | 44.980 | 130/4 100 | 6,445 |
| 154,000 | 126,581 | 45,455 | 13072 700 13064 800 13057 100 13049 700 13042 600 | 6,242 |
| 156,000 | 130.792 | 45.914 | 13035,700 13029,000 13022,637 13016,500 | 6.038 |
| 158.000 | 135.001 | 46,358 | 1305A 000 | 5.834 |
| 160.000 | 139,209 | 46.786 47.199 | 13022,637 | 5,630 |
| 162.000 | 143,416 | 47,199 | 13010 200 | 5,426 |
| 164,000 | 147,623 | 47.596 | | 5,221 |
| - • • • • • | . 4. , 523 | 47,976 | 13004 900 | 5,017 |

TABLE 14. (CONT'D)

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| TIME | RANGE | | | |
|-----------|---------------------|------------------|-----------|---------------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | 44 500 | | 04711 |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | PATH |
| 166.000 | 151.828 | (NMI) | (FT/SEC) | WILE TO SEE |
| 168.000 | 156.032 | 48 • 345 | 12000 | (DEG) |
| 170,000 | 160 225 | 48.696 | 12004 344 | 4.512 |
| 1/2,000 | 160 235 | 49.032 49.352 | 12989 237 | 4.607 |
| 174.000 | 164 438 168 640 | 49,352 | 12984 500 | 4,402 |
| 176.000 | 170.040 | 77.03/ | 129791987 | 4.197 |
| 178-000 | 172.841 | 49.947 | 12975.700 | 3,991 |
| 188.000 | 177.042 | 50.221 | 12971.637 | 3.786 |
| 198-000 | 198.035 | 51.362 | 12954.700 | 3•580 |
| 208.000 | 219-017 | 52.119 | 12943.469 | 2.550 |
| 218.000 | 239.991 | 52.491 | 12937.900 | 1.519 |
| 228.000 | 260.964 | 52.480 | 12937.962 | •485 |
| 238.000 | 281.938 | 52.084 | 12942 402 | ~•548 |
| 248.000 | 302.919 | 51 • 304 | 12943.600 | - 1.58 ₁ |
| 258.000 | 323.912 | 50.140 | 12954.887 | -2.613 |
| 260-000 | 344.920 | 48.591 | 12971.700 | -3.643 |
| 260.000 | 349.125 | 48.235 | 12994-106 | -4.67 ₀ |
| 262.000 | 353.330 | 47.864 | 12999.200 | -4.875 |
| 264.000 | 357.535 | 47.477 | 13004.531 | -5. ₀ 8 ₀ |
| 266.000 | 361.742 | 47.075 | 13010.100 | -5.284 |
| 268.000 | 365•9 ₅₀ | 46.657 | 13015.856 | -5.489 |
| 270.000 | 370 • 158 | 46.224 | 13021.800 | -5.693 |
| 272.000 | 374.368 | 45.776 | 13028.019 | -5.897 |
| 274.000 | 378.579 | 45.710 | 13034.400 | -6.101 |
| 276.000 | 382,790 | 45.312 | 13041.031 | -6.305 |
| 278.000 | 387.003 | 44.833 | 13047.800 | -6.508 |
| 280.000 | 391.217 | 44.339 | 13054.756 | -6.712 |
| 285.000 | 395 • 432 | 43.829 | 13061.900 | -6.915 |
| 284.000 | 399.648 | 43.304 | 13069.200 | -7.118 |
| 286.000 | 403-865 | 42.763 | 13076.600 | -7.321 |
| 288.000 | 408-084 | 42.207 | 13084.275 | 7.524 |
| 290.000 | 412.304 | 41 • 635 | 13092.000 | -7.726 |
| 275+UUU | 416.525 | 41 • 048 | 13099.950 | - 7.928 |
| 294.000 | 420.747 | 40.446 | 13107.900 | -8·130 |
| 296•nnn | 424.971 | 39.828 | 13116.044 | -8.332 |
| 5A8 • 000 | 429-196 | 39 • 195 | 13124-100 | -8.533 |
| 300•000 | 433.421 | 38.546 | 13132.350 | -8.734 |
| 302.000 | 437.648 | 37.882 | 13140.400 | -8.935 |
| 304•000 | 441.876 | 37.202 | 13148,656 | -9·136 |
| 300.000 | 446.105 | 36.507 35.797 | 13156.500 | -9·336 |
| 308.000 | 450.334 | 33•/Y/ | 13164.544 | -9.536 |
| 310.000 | 454.565 | 35.072 | 13172.000 | -9.737 |
| 312.000 | 458,796 | 34 • 331 | 13179.669 | -9.937 |
| 314.000 | 463.028 | 33.575 | 13186.200 | -10.136 |
| • • | . 22.050 | 32.803 | 13193.119 | -10·136 -10·335 |
| | | | | 10.332 |

TABLE 14. (CONT'D)

| TIME | RANGE | | | |
|-----------|--|--|---|--------------------|
| FRON | FROM | | | |
| LAUNCH | LAUNCH | AL TITUDE | 145 0 a 7 5 c | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| 316.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 318.000 | 467.259 | 32.016 | 13198.400 | -10.535 -10.734 |
| | 471,492 | 31,214 | 13203,825 | -10.734 |
| 320,000 | 413,155 | 30.397 | 13206 900 | "10 933 |
| 322,000 | 417, 994 | 29,564 | 13206,90¢ 13210,233 | _10_933 _11_133 |
| 324.000 | 471.492 475.722 479.954 484.182 486.409 | 28,719 | 13209 800 | -11,331 |
| 326,000 | 4004403 | 27.857 | 13208,200 | _11.530 |
| 328.000 | 492+633 | 264981 | 13203.700 | -11.728 |
| 330 • 000 | 496 • 853 | 26•090 | 13195.700 | -11.927 |
| 332.000 | 501.068 | 25 • 186 | 13183-100 | -12-127 |
| 334.000 | 505,276 | 24,267 | 13164,400 | -12,326 |
| 336,000 | 509,474 | 23,336 | 13137,500 | _12 526 |
| 338,000 | 513,660 | 22,392 | 13100 000 | _12 526 _12 727 |
| 340,000 | 517,830 | 21,436 | 13048 500 | 12,630 |
| 342,000 | 521,979 | 20 470 | 12978 600 | _12 930 _13 133 |
| 344,000 | 526,099 | 19,495 | 12884 600 | 13,339 |
| 346,000 | 509 474 513 660 517 830 521 979 526 099 530 182 | 18,514 | 12758 800 | _13_548 |
| 348,000 | 534,217 | 17,529 | 12591 500 | 13,760 |
| 350,000 | 538 187 | 16,544 | 12369 600 | _13_978 |
| 352,000 | 534 217 538 187 548 474 | 15,564 | 12084 000 | 14,203 |
| 354,000 | 545 856 549 507 | 19,495 18,514 17,529 16,544 15,564 14,594 13,642 12,715 | 11722 700 | -14 437 |
| 355,000 | 549,507 | 13,642 | 11274 300 | 14 684 |
| 320,000 | 552,997 | 12,715 | 10731 000 | 14.947 |
| 360,000 | 556 297 | 11.823 | 10092 100 | 15 232 |
| 362,000 | 559 377 | 11 823 10 973 10 173 | 9365 700 | 15 544 |
| 304,000 | 562,210 | 10,173 | 8563 200 | -15,544 |
| 366,000 | 564,778 | 9,431 | 7716.400 | -15,890 |
| 368,000 | 567,072 | 8,750 | 6862 800 | -16,280 16,735 |
| 370.000 | 569,097 | 8,131 | 6038.700 | -16,725 |
| 372,000 | 570,866 | 7,571 | 5271 500 | -17,236 |
| 374,000 | 572.401 | 7.067 | 4575°000 | -17.827 |
| 376,000 | 573.724 | 6,613 | 5271 500 4575 000 3951 800 3408 000 2941 800 | -18,512 |
| 378,000 | 5/4 860 | 6,204 | 3408 000 | -19,308 |
| 380,000 | 575 834 | 5.835 | 2941 800 | -20,232 |
| 382,000 | 576,669 | 5,499 | 2546 800 | -21,302 |
| 304 000 | 577 386 | 5,191 | 2212 500 | -22 535 |
| 386,000 | 578,003 | 4,906 | 1630 500 | .23 947 .25 554 |
| 388,000 | 578,536 | 4,641 | 1497 300 | -25,554 |
| 390.000 | 578,998 | 4.392 | 2546 800 2212 500 1930 200 1697 200 1504 000 1343 500 1211 700 1105 900 1033 100 983 800 | -27 366 |
| 392.000 | 579,401 | 7,37E 4 18E | 1343 500 | -29,386 |
| 394.000 | 579.753 | 4,155 | 1343,300 | -31,611 |
| 396,000 | 580.064 | 3.927 3.707 | 1511,00 | -34.031 |
| 398,000 | 580.340 | 3,101 | 1105,700 | _36,623 |
| 400.000 | 580.591 | 3,491 | 1033,100 | _39_337 |
| | 200-221 | 3,275 | A22°200 | -42,102 |

TABLE 14. (CONT'D)

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or a

| TIME FROM | RANGE From | | | |
|--------------|---------------|----------|----------------------|------------------|
| LAUNCH | LAUNCH | ALTITUDE | W21 001 54 | PATH |
| (SEC) | | | VELOCITY | ANGLE |
| 13207 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 402.000 | 580.822 | 3.057 | 950.200 | - • |
| 404.000 | 581.035 | 3,03, | | ~44 • 863 |
| 406,000 | | 2.834 | 926.800 | -47.574 |
| 100,000 | 581,234 | 2,605 | 910 400 | -50 206 |
| 408,000 | 581,419 | 2,373 | | |
| 410,000 | 581,592 | | 898 900 | -52 / 38 |
| 412 004 | 201,272 | 2,135 | 890 700 | -55 157 |
| 412,000 | 581.754 | 1,892 | 884 700 | |
| 414,000 | 581,905 | 1,644 | | -57 ,455 |
| 426,662 | 592 455 | | 880 300 | -59 630 |
| . 40 | 582 655 | 0,000 | 851 [*] 354 | 70 712 |

TABLE 15. TRAJECTORY T3N.10 (111)

| TIME | RANGE | | | |
|------------------------------------|----------------|----------------|--|------------------|
| FROM | | | | |
| LAUNCH | FROM Launch | 44.5 | | DATE |
| (SEC) | | ALTITUDE | VELOCITY | PATH ANGLE |
| 0.000 | (NMI) | (NMI) | (FT/SEC) | |
| 2.000 | 0.000 | 0.000 | 0.000 | (DEG) |
| 4.000 | 0.000 | •004 | 35,900 | 90.000 |
| 6,000 | 0.000 | .024 | 85 000 | 90.065 |
| 8,000 | 0.000 | .061 | 85 000 135 800 | 90,000 |
| 10 000 | 0,000 | ,114 | 188, 397 | 90.000 |
| 6.000 8.000 10.000 12.000 | .005 | ,185 | 263 500 | 90,000 |
| 14,000 | .015 | ,273 | 299 800 358 900 | 84 128 82 554 |
| 16,000 | .031 | .380 | 358 900 | 80,949 |
| 18,000 | .053 .082 | .507 | 420,400 | 79,329 |
| 20,000 | .121 | .653 | 484 000 | 77.706 |
| 22.000 | .170 | .818 | 420 400 484 000 550 600 | 76 091 |
| 24.000 | .230 | 1.004 | 619 300 691 000 765 600 | 74,494 |
| 26,000 28,000 30,000 | 304 | 1,211 | 691,000 | 72,914 |
| 28,000 | .392 | 1,439 | 765 600 | 71 363 |
| 30,000 | .496 | 1,689 | AAS SAA | 69 843 |
| 3 ~ _000 | 617 | 1,961 | 924 044 | 68,357 |
| 34,000 | 756 | 2,254 | 1005,600 | 66,904 |
| 36,000 | 914 | 2,569 | 1005,600 1089,200 | 65,488 |
| 38,000 | 1.093 | 2,907 3,265 | 1174 500 | 64 106 |
| 40.000 | 1.295 | 3.645 | 1262 100 1352 400 | 62 758 |
| 42.000 | 1.519 | | 1352,400 | 61,444 |
| 44 • O O O | 1.768 | 4.047 | 1447-100 | 60.166 |
| 46 • 0 n c | 2.044 | 4.472 | 1544.900 | 58.922 |
| 48•000 | 2.347 | 4.918 | 1547.300 | 57.717 |
| 50.000 | 2.680 | 5•388 5•882 | 1754.500 | 56.548 |
| 52,000 | 3.044 | | 1866.800 | 55.418 |
| ⊃ 4•0∩∩ | 3.441 | 6•400 6•944 | 1984.500 | 54.325 |
| 56.000 | 3.873 | 7.513 | 2108.300 | 53.272 |
| 58.000 | 4 • 341 | 8.109 | 2238.500 | 52.256 |
| 60.000 | 4 • 8 4 9 | 8.733 | 2375 - 200 | 51.279 |
| 62.000 | 5•397 | 9.386 | 2518.700 | 50.339 |
| 64.000 | 5.989 | 10.069 | 2669.400 | 49.437 |
| 66.000 | 6 • 6 2 5 | 10.782 | 2827.3 ₀₀ 2992.7 ₀₀ | 48,571 |
| 68.000 | 7.310 | 11.526 | 3165.900 | 47.715 |
| 70.000 | 8.047 | 12.302 | 3347.100 | 46.835 |
| 72.000 | 8.837 | 13-110 | 3536.500 | 45.938 |
| 74.330 76.000 | 9.686 | 13.950 | 3734.400 | 45.032 |
| 78.000 | 10.595 | 14.821 | 3941.100 | 44.121 |
| 80.000 | 11.568 | 15.726 | 4156.800 | 43.204 |
| 82.000 | 12.609 | 16.662 | 4381.900 | 42.282 |
| 84.000 | 13.722 | 17.631 | 4616.600 | 41.350 |
| - 7 0 0 0 | 14.911 | 18.632 | 4861.200 | 40.403 |
| | | | | 39.431 |

| | T | ABLE 15. (CO | NT'D) | |
|---|---|------------------|------------------------|--|
| TIME | RANGE | (60 | 111 D) | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 86.000 | 16.179 | | (FT/SEC) | (DEG) |
| 03 000 | 17.533 | 19.664 | 5116.100 | 38 • 422 |
| 90,000 | 18 976 | 20.724 | 5381.300 | 37,365 |
| 92 000 | 20 515 | 21,813 | 5657,100 | 36,243 |
| 94 000 | 22,155 | 22,925 | 5943 600 | 35 038 |
| 96 000 | 23 904 | 24.057 | 6240 200 | 33,727 |
| 98 000 | 18,976 20,515 22,155 23,904 25,767 | 25,204 | 6546,000 | 33,727 32,287 |
| 90.000 92.000 94.000 96.000 98.000 100.000 104.000 106.000 108.000 110.000 | 25,767 27,752 | 26,356 | 6859 600 | 30 [*] 693 28 [*] 931 |
| 102 000 | 20 844 | 27,505 | 7179 500 | 28 931 |
| 104 000 | 32 100 | 28,638 | 7502 300 | 26.971 24.793 |
| 106 000 | 29.864 32.109 34.489 37.006 | 29.740 | 7824 200 | 24, 793 |
| 108 000 | 37,407 | 30,791 | 8139 300 | 22 373 19 685 |
| 110 000 | 37,000 | 31,771 | 8439 500 | 19 685 |
| 112 000 | 37,055 | 32,654 | 8715,300 | 16,713 |
| 112.000 114.000 | 45,433 | 33,418 | 9016,200 | 16,713 13,719 |
| 116,000 | 39,655 42,433 45,352 | 34,064 | 9398 300 | 11,020 |
| 118 000 | 48,431 51,795 55,265 | 34,604 | 9861 500 | 8 686 |
| 118,000 | 21,795 | 35,050 | 10405 100 | 6,775 |
| 120.000 | 55,265 | 35,419 | 11027,200 | 8 686 6 775 5 334 |
| 122,000 | 58,956 | 35,733 | 11725 500 | 4 399 |
| 124,000 | 62,889 | 36.021 | 12496 000 | 3,998 |
| BURN-OUT | OF STAGE | 1 4- | · | • |
| -5/116-007 | U: SINGE | 1 AT | | |
| 125.400 | 65.780 | 34.221 | 12011 000 | 5 045 |
| | | 3 1222 | 12811.000 | 3,848 |
| | | | | |
| 126.000 | 67.029 | 36.305 | 12000 100 | 2 70. |
| 128,000 | 71 101 | | 12809.100 | 3.784 |
| 130,000 | 75 352 79 512 83 671 87 828 91 985 96 141 100 296 104 449 | 36,575 36,830 | 12802,900 | 3,572 |
| 132,000 | 79 512 | 36,830 37,069 | 12797 019 | 3 360 3 148 |
| 134,000 | 83 671 | 37,069 | 12791 500 | 3,148 |
| 136.000 | 87 828 | 37,292 37,500 | 12786 331 | 2,935 2,722 |
| 138.000 | 91 985 | 37,500 37,693 | 12781 400 | 2,722 |
| 2 9 11 11 11 11 | 96 141 | 37.692 | 12776 912 | 2,509 |
| 142.000 | 100 296 | 37 868 38 029 | 12772 700 12768 744 | 2 296 2 083 |
| 144 000 | 104 449 | 38,029 | | 2,083 |
| 146,000 | 108 602 | 38 174 38 303 | 12765 100 | 1 870 |
| 143,000 | 112 755 | 30,303 | 12761 756 | 1 656 |
| 150,000 | 116 906 | 38.417 38.515 | 12758 600 | 1,443 |
| 152,000 | 104.449 108.602 112.755 116.906 121.057 125.207 129.357 133.506 137.656 | 38 515 38 597 | 12755 800 | 1,230 |
| 154,000 | 125 207 | 38,597 38,664 | 12753 300 | 1,016 |
| 156,000 | 129.357 | 38.715 | 12751 000 | ,802 502 |
| 158,000 | 133,506 | 38.750 | 12748,900 | .589 |
| 160,000 | 137.656 | 38.770 | 12747 119 | 375 |
| 162,000 | 141.804 | 38.774 | 12745,600 | ,161 |
| 164,000 | 145,952 | 38,762 | 12744 312 | - .053 |
| | 5 · - 6 · - 4 | 20,102 | 12743,200 | - 267 |

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TABLE 15. (CONT'D)

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|--|----------------------|--------------------------|--|---|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | AEFOCILA | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 166.000 168.000 | 150.100 | 38.735 | 12742.400 | 481 |
| 170 000 | 154,247 | 38.692 | 12741,800 | -,694 |
| 172 000 | 158, 394 162, 541 | 38,633 | 12741 381 | -,908 |
| 174 000 | 166 688 | 38,559 | 12741 200 | -1,122 |
| 176,000 | 170 834 | 38,469 38,363 | 12741 244 12741 400 | -1,336 |
| 170 000 172 000 174 000 176 000 178 000 180 000 | 174 980 | 38,242 | 12741 837 | - 908 -1 122 -1 336 -1 550 -1 764 -1 978 |
| 180.000 | 179.126 | 38.105 | 12742.500 | 1.979 |
| 182.000 | 183-272 | 37.952 | 12743.306 | -2.192 |
| 184-000 | 187.417 | 37.784 | 12744-200 | 2.406 |
| 186-000 | 191.563 | 37-600 | 12745-388 | -5. 650 |
| 188-000 | 195.709 | 37-400 | 12746-700 | ~2.833 |
| 190.000 | 199.854 | 37 • 185 | 12748-138 | -3.047 |
| 192.000 | 203.999 | 36•954 | 12749.700 | -3.261 |
| 194.000 | 208-145 | 36.708 | 12751 • 462 | -3.475 |
| 196 • 000 198 • 000 | 21? 2 ⁹ 0 | 36•446 | 12753-200 | ~3•688 |
| 200.000 | 216•436 220•581 | 36•168 | 12755 • 169 | -3·9 ₀₁ |
| 202-000 | 224.726 | 35•874 35•565 | 12757 • 200 12759 • 300 | 74-115 |
| 204-000 | 228.871 | 35•240 | 12761.300 | -4.328 |
| 206-000 | 233-016 | 34.900 | 12763.512 | -4.541 -4.754 |
| 208-000 | 237.160 | 34.544 | 12765.600 | -4.968 |
| 210.000 | 241•305 | 34 • 172 | 12767.794 | -5.181 |
| 212.000 | 245.449 | 33.785 | 12769.700 | -5.394 |
| 214.000 | 249.593 | 33°385 | 12771.756 | -5.607 |
| 216-000 | 253•736 257 879 | 32.963 | 12773.400 | -5.820 |
| 218-000 220-000 | 257.879 262.021 | 32.529 | 12775.125 | -6.033 |
| 222.000 | 266.163 | 32.080 | 12776.200 | -6.245 |
| 224-000 | 270.303 | 31.615 31.134 | 12777.344 12777.600 | -6,457 |
| 226.000 | 274.443 | 30.638 | 12777.781 | -6.67 ₀ -6.883 |
| 229.000 | 278.580 | 30 • 126 | 12776.800 | -7. 095 |
| 23c•000 | 282.717 | 29.598 | 12775.633 | -7.307 |
| 232.000 | 286.851 | 29.056 | 12772.900 | - 7,521 |
| 234.000 | 290.983 | 28.498 | 12769.400 | -7.733 |
| 236.000 | 295.112 | 27.925 | 12764.600 | -7.946 |
| 238 • 000 | 299.238 | 27 • 336 | 12758 - 100 | -8.159 |
| 240.000 | 303.360 | 26.733 | 12749.700 | -8.372 |
| 242·000 244·000 | 307.478 | 26 • 114 | 12738.900 | -8.585 |
| 246.000 | 311•590 315•695 | 25•481 | 12725 • 400 | -8.799 |
| 248.000 | 319.793 | 24 • 833 24 • 170 | 12708.300 | -9. 013 |
| 250.000 | 323.881 | 24 • 1 7 0 23 • 4 9 4 | 12686.7 ₀₀ 12659.6 ₀₀ | -9.227 |
| - V · V · V | 252,401 | 634474 | 150234000 | -9.442 |

TABLE 15. (CONT'D)

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| TIME | RANGE | | - | |
|---|-----------|--------------------------------------|----------------------|-------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | 41 777 | | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| 252.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 254.000 | 327 • 958 | 22.803 | 12625.900 | -9.658 |
| 256 000 | 332.020 | \$5.099 | 12583,800 | -9.875 |
| 258 000 | 336,066 | 21,383 | 12531 500 | _10_094 |
| 260 000 | 340 091 | 20,654 | 12466 500 | -10,313 |
| 263 000 | 344.090 | 19,914 | 12385 900 | -10,535 |
| 256 000 258 000 260 000 262 000 | 348,059 | 19,163 | 12285 800 | -10,760 |
| 264,000 | 351,990 | 18,404 | 12161 900 | |
| 200,000 | 355,874 | 17,638 | 12008 500 | -10,987 |
| 200,000 | 359,700 | 16.867 | 11817 800 | -11,219 |
| 270,000 | 363,457 | 16,094 | 11586 200 | -11,455 |
| 272,000 | 367,130 | 15,322 | 11307 700 | -11 698 |
| 274,000 | 370,702 | 16 094 15 322 14 554 13 795 | 10976 400 | -11,950 |
| 276,000 | 374,156 | 13,795 | 10587 400 | -12,211 |
| 278,000 | 377,473 | 13 049 | 10137 900 | -12,485 |
| 580,000 | 380,634 | 13.049 12.321 | 9628 200 | -12,774 |
| 282,000 | 383 619 | 11 616 | 9628 200 9058 400 | -13 082 |
| 262.000 264.000 266.000 270.000 272.000 274.000 276.000 278.000 280.000 282.000 284.000 286.000 288.000 | 386 409 | 11 616 10 939 10 295 | 8434 900 | _13 414 |
| 286 000 | 388 991 | 10 295 | | _13 774 |
| | 391.354 | 9.687 | 7773 000 | _14_170 |
| 290.000 | 393.497 | | 7093.200 | _14.609 |
| 292.000 | 395•423 | 9-118 | 6415.700 | -15-099 |
| 294-000 | 397 • 143 | 8•587 | 5759.700 | -15.648 |
| 296.000 | 398.668 | 8 • 095 | 5138.500 | -16.268 |
| 298 • 000 | 400.013 | 7.639 | 4561.400 | -16.969 |
| 300.000 | 401-195 | 7•218 | 4030-000 | -17.764 |
| 302.000 | 402+230 | 6.828 | 3551.200 | -18.667 |
| 304.000 | 403-135 | 6.468 | 3126.700 | -19.692 |
| 306.000 | 403.925 | 6.134 | 2753.500 | -20.852 |
| 308.000 | | 5.822 | 2423.900 | -22.163 |
| 310.000 | 404-615 | 5.531 | 2138.500 | -23.639 |
| 312.000 | 405.217 | 5.257 | 1892.300 | -25.294 |
| 314.000 | 405.743 | 4.998 | 1685.000 | -27.134 |
| 316.000 | 406.206 | 4.750 | 1509.800 | -29.160 |
| 318.000 | 406.613 | 4.513 | 1361.100 | -31.371 |
| 320-000 | 406.972 | 4.283 | 1236.700 | -33.756 |
| 320.000 322.000 | 407-291 | 4.060 | 1133.200 | -36.298 |
| 324.000 | 407.575 | 3.840 | 1056.300 | -38.961 |
| 324.000 | 407.833 | 3.621 | 1003-100 | -41.685 |
| 326.000 | 408-069 | 3 401 | 966.400 | -44.414 |
| 353 • 096 | 410.057 | 0.000 | 854.615 | -72.004 |
| | | • • • | = • | · E • U U • |

TABLE 16. TRAJECTORY T3N.10 (112.5)

| TIME | RANGE | | (====, | |
|----------------------------|------------------|----------------|----------------------|----------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 0.000 | 0.000 | 0.000 | (FT/SEC) 0.000 | (DEG) |
| 2.000 | 0.000 | .004 | 35,900 | 90.000 |
| 4 000 | 0,000 | 2024 | 85,000 | 90.000 |
| 6,000 | 0,000 | 061 | 135 800 | 90,000 |
| 8.000 10.000 12.000 | 0.626 | 114 | 188 300 | 90.000 90.000 84.128 |
| 10,000 | 635 | 185 | 243 000 | 90,000 |
| 12,000 | .015 | 273 | 299.800 | 82,554 |
| 14 000 16 000 18 000 | .031 | 380 | 358 900 | 80 940 |
| 16,000 | .053 | 507 | 420 400 | 79*329 |
| 18,000 | .082 | 653 | 484,000 | 79°329 77°706 |
| 20,000 | .121 | .818 | 550 600 | 76,091 |
| 22.000 | .170 | 1,004 | 619,300 | 74 494 |
| 24.000 | .230 | 1,211 | 691 000 | 74 494 72 914 71 363 |
| 26,000 28,000 | .304 | 1,439 | 765 690 | 71 363 |
| 20,000 | .392 | 1,689 | 843 300 | 69 843 |
| 30.000 32.000 | .496 | 1,961 | 924 000 | 68 357 |
| 36,000 | 617 | 2,254 | 1005 600 | 66 904 |
| 34,000 | 756 | 2,569 | 1089 200 | 65,488 |
| 36,000 38,000 | 914 | 2,907 | 1174 500 | 64, 106 |
| 40.000 | 1 093 1 295 | 3 265 | 1262 100 | 62 758 |
| 47 868 | 1,519 | 3,645 | 1352,400 | 61 444 |
| 44 000 | 1.768 | 4 047 | 1447 100 | 60 166 |
| 46 000 | 2 044 | 4 472 | 1544 900 | 58 922 |
| 48 000 | 2.347 | 4 918 5 288 | 1647 300 | 57 717 |
| 50 000 | 2,680 | 5 388 | 1754 500 | 56 548 |
| 52,000 | 3.044 | 5 882 | 1866 800 | 55,418 |
| 54 000 | 3,441 | 6,400 | 1984,500 | 54,325 |
| 54 000 56 000 58 000 | 3.873 | 6 944 | 2108 300 | 53 272 |
| 58,000 | 4.341 | 7,513 8,109 | 2238 500 2375 200 | 52,256 |
| 60.000 | 4,849 | 8.733 | 2375°200 | 51,279 |
| 62,000 | 5,397 | 9.386 | 2518,700 2669,400 | 50.339 |
| 64.000 | 5 989 | 10.069 | 2827 300 | 49,437 |
| 66,000 | 6,625 | 10.782 | 2992.760 | 48,571 47,715 |
| 68,000 | 7,310 | 11,526 | 3165,900 | 46,835 |
| 70.000 | 8,047 | 12,302 | 3347,160 | 45,938 |
| 72.000 | 8 837 | 13,110 | 3536,500 | 45,032 |
| 74.000 | 9,686 | 13,950 | 3734,400 | 44.121 |
| 76.000 | 10.595 | 14,821 | 3941,100 | 43,204 |
| 78.000 | 11.568 | 15,726 | 4156 800 | 42.282 |
| 80,000 | 12,609 | 16,662 | 4381 900 | 41.350 |
| 82,000 | 12.609 13.722 | 17,631 | 4616,600 | 40.403 |
| 84,000 | 14,911 | 18,632 | 4861 200 | 39,431 |
| | | | | |

TABLE 16. (CONT'D)

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|-------------|---|----------|----------------------------------|---|
| TIME | RANGE | | | |
| FR04 | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 16-179 | 19.664 | sll s_log | 38.422 |
| 88,000 | 17,533 | 20.724 | 5381,300 | 37,365 |
| 90,000 | 18,976 | 21,813 | 5657 100 | 36,243 |
| 92.000 | 20.515 | 22.925 | 5381,300 5657,100 5943,600 | 35.038 |
| 94.000 | 22 • 155 | 24.057 | 6240-200 | 33.72? |
| 96•000 | 23-904 | 25-204 | 6546.000 | 32.287 |
| 98-000 | 25•767 | 26.356 | 6859-600 | 30 - 693 |
| 100.000 | 27.752 | 27.505 | 7179.500 | 28.931 |
| 102-000 | 29•864 | 28.638 | 7502.300 | 26.971 |
| 104.000 | 32.109 | 29.740 | 7824-200 | 24.793 |
| 106.000 | 34.489 | 30.791 | 8139.300 | 22.373 |
| 108-000 | 37.006 | 31.771 | 8439.500 | 19.685 |
| 110 • 000 | 39.655 | 32.654 | 8715.300 | 16.713 |
| 112.000 | 42.429 | 33.413 | 8969.500 | 13.501 |
| 114.000 | 45.325 | 34.031 | 9272.800 | 10.346 |
| 116.000 | 48.360 | 34.511 | 9664.400 | 7.463 |
| 118.000 | 51.660 | 34.860 | 10145.600 | 4.928 |
| 120.000 | 55.049 | 35.089 | 10717.400 | 2.808 |
| 122.000 | 58,644 | 35.211 | 11380.000 | 1.157 |
| 124.000 | 62.472 | 35.247 | 12133.400 | •019 |
| 011011 0115 | | | | • |
| BUKN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 65.287 | 35.236 | 19447 100 | 222 |
| | 031201 | 33.530 | 12447.100 | 382 |
| | | | | |
| 126.000 | 66.503 | 35.227 | 12446.500 | - 440 |
| 128,000 | 70 558 | 35 187 | 12444 300 | -,449 |
| 130,000 | 74,612 | 35,131 | 12442 437 | - 672 |
| 132,000 | 78 666 | 35,059 | 12440 700 | 895 |
| 134,000 | 82.719 | 34,971 | 12439,225 | _1 118 _1 341 |
| 136.000 | 86.770 | 34.868 | 12437.900 | -1 341 |
| 138.000 | 90.821 | 34.748 | | -1.564 |
| 140.000 | 94.872 | 34.612 | 12436.744 | -1.787 |
| 142.000 | 98.921 | 34.461 | 12435.700 | -2.010 |
| 144.000 | 102.970 | 34.293 | 12434.975 | *2.233 |
| 146.000 | 107.019 | 34.273 | 12434 • 100 | *2.456 |
| 148.000 | 111.066 | 33.911 | 12433.531 | -2.679 |
| 150:000 | 115.113 | 33.696 | 12433.000 12432.650 | -2.9 02 |
| 152.000 | 119.160 | 33.465 | 12432.200 | -3. 125 |
| 154.000 | 123.206 | 33.405 | 12431.944 | -3.348 |
| 156.000 | 127.250 | 32.955 | 12431.600 | -3.57 ₁ -3.794 |
| 158.000 | 131.294 | 32.676 | 12431.331 | - |
| 160.000 | 135.337 | 32.382 | 12430.800 | . -4. 017 -4. 240 |
| 162.000 | 139.379 | 32.071 | 12430.444 | -4. +63 |
| 164.000 | 143.420 | 31.745 | 12429.700 | -4.686 |
| - • • | • · · · · · · · · · · · · · · · · · · · | 21 | 1545.4.00 | OOO |

TABLE 16. (CONT'D)

| TIME | RANGE | | | |
|---|--|------------------|--|-------------------------------|
| FR04 | FROM | | | _ |
| LAUNCH | LAUNCH | ALTITUDE | UEI AGITY | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY (FT/SEC) | ANGLE |
| 166.000 | 147.460 | 31.403 | 12429.025 | (DEG) |
| 168.000 | 151 498 | 31.044 | | 4.909 |
| 170.000 172.000 | 155,536 | 30,670 | 12427.800 | -5,133 |
| 172,000 | 159,571 | 30,281 | 12426 506 12424 600 | -5,356 |
| 1/4,000 | 163 6n6 | 29 A75 | 12424 000 | -5,579 |
| 176,000 | 16/ 637 | 29 875 29 454 | 12422 567 12419 500 | -5,802 |
| 178,000 | 117,001 | 29.017 | 12414 140 | -6 025 |
| .80 000 | 175 694 | 28 565 | 12416 100 12411 900 | -6 248 |
| 174,000 176,000 178,000 180,000 132,000 | 179.719 | 28.096 | 12406.800 | -0.4/1 |
| 1.34 • 000 | 183.740 | 27-613 | | _6.695 |
| 186.000 | 187 • 758 | 27-113 | 12400-500 | -6.918 |
| 188.030 | 191.772 | 26.598 | 12392-800 | -7-142 |
| 190.900 | 195.781 | 26,068 | 12383.600 12372.500 | -7-366 |
| 192 000 | 199,785 | 25,523 | 12359 100 | -7.590 |
| 194 000 | 203.782 | 24,962 | 12359 100 | <u>-7.815</u> |
| 190,000 | 20/_772 | 24 386 | 12323 300 | -8 039 |
| 194 000 196 000 198 000 200 000 202 000 | 211,753 | 24,386 23,796 | 12342 900 12323 300 12299 500 | . 8 265 |
| 200,000 | 215,725 | 23,191 | | -8 491 |
| 202,000 | 217,684 | 22,572 | 12235 800 | -8,717 8,445 |
| 204,000 | <i>66</i> 3, 629 | 21,938 | 12235 800 12193 400 | -8 945 9 173 |
| 200,010 | 221,351 | 21,292 | 12142 100 | -9 173 -9 403 |
| 204 000 206 000 208 000 210 000 | C31 402 | 20,633 | 12142 100 12142 100 12079 900 12004 400 11912 600 11801 200 | -9.635 |
| 212 000 | 235,349 239,205 | 19,961 | 12004 400 | -9.868 |
| 212.000 214.000 | 239,205 | 19,279 | 11912 600 | -10,105 |
| 216,000 | 243,025 | 18,586 | 11801 200 | _10_344 |
| 218 ann | 250.533 | 17,884 | 11665,900 | -10.586 |
| 220.000 | 237.205 243.025 246.804 250.532 254.200 257.795 261.315 264.715 268.011 271.174 | 17,176 | 11665 900 11501 600 | _10_834 |
| 222 AAA | 257 705 | 16,462 | 11302 300 | -11,00/ |
| 224 000 | 261 315 | 15,746 | 11065 900 | -11,348 |
| 226 000 | 264 715 | 15,029 | 10786 900 | _11 617 |
| 228 000 | 268°011 | 14,317 | 10461 100 | _11_897 |
| 230 000 | 271°174 | 13,611 | 10085 100 9657 200 | -12,190 |
| 224 000 226 000 228 000 230 000 232 000 | 274.188 | 12.916 12.236 | 9037 200 | _11 897 _12 190 _12 499 |
| 234•000 | 277.037 | 11.577 | 9175.400 | -15-858 |
| 236.000 | 2 90704 | 10.941 | 8642.000 | -13-181 |
| 238 • 000 | 282-178 | | 8054.700 | -13.564 |
| 240.000 | 284 • 452 | 10•333 9•755 | 7456.400 | - 13•981 |
| 242.000 | 28 .523 | 9.211 | 6833.900 6213,600 | -14.441 |
| 244,000 | 288 395 | 8,700 | 5611 100 | -14.95Î |
| 246,000 | 290`076 291`577 | 8,553 | 5036,600 | _15_519 _16_155 |
| 248,000 | 291,577 | 7,777 | 4498 300 | -10 122 |
| 250,000 | 292° 708 | 7,363 | 3999.700 | -10 09A |
| | = | | 2 | -17.674 |

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TABLE 16. (YOM'D)

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Part No.

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- Comment

| TIME | RANGE | | | |
|-------------------------------|--------------------|----------------|--------------------|--------------------|
| FR04 | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 252.000 | 294.084 | 6.977 | 3544.600 | -18.581 |
| 254.000 | 295.120 | 6.618 | 3138.300 | -19.605 |
| 256,000 | 296,032 | 6,283 | 2777,700 | -20.758 |
| 258,000 | 296,831 | 5,969 | 2456 500 | -22,055 |
| 260,000 | 297,532 | 5,675 | 2174 400 | -23,511 |
| 262,000 | 298,146 | 5,398 | 1929 300 | -25,137 |
| 264,000 | 298,684 | 5,135 | 1720,900 | -26,942 |
| 266,000 | 299, 157 | 4.884 | 1544,600 | -28,928 |
| 268,000 | 299,575 | 4,642 | 1393 500 | 31 093 |
| 270,000 | 299 944 | 4,409 | 1266 400 | _33_430 |
| 268 000 270 000 272 000 | 300.272 | 4.183 | 1159,600 | 35.922 |
| 274-000 | 300.564 | 3.961 | 1975.700 | -38.544 |
| 276.000 | 300.828 | 3.740 | 1017.600 | -41.241 |
| 278-200 | 301.069 | 3.518 | 977.300 | -43.955 |
| 280.000 | 301 • 291 | 3.563 | 949.000 | 746-641 |
| 282,000 | 301.498 | 3,064 | 928,900 | -49.263 |
| 284 000 286 000 | 301,690 | 2,830 | 914 500 | 51 799 |
| 286,000 | 301 870 | | 904 100 | 54 231 |
| 588 000 | 302,038 | 2 591 2 347 | 896 500 | 56 550 |
| 292,000 | 302,196 | 2.098 | 890 800 | |
| 292,000 | 302,343 | 1.846 | 886 300 | _58 752 |
| 294,000 | 302,480 | 1.589 | 882 600 | _60_834 |
| 286.000 | 302 608 | 1,329 | 879,400 | -62,798 |
| 258 000 | 302,608 302,728 | 1.066 | 876 500 | -64,647 |
| 300,000 | 302.840 | | 873 500 | _66 383 _68 013 |
| 302.000 | 302,943 | .800 .533 | 873 500 868 900 | -00-013 |
| 304.000 | 303.040 | .265 | 842 800 | -69,541 |
| 305,970 | 303,128 | | 862,800 | -70,977 |
| • • | | 0.000 | 855,419 | _72,306 |

TABLE 17. TRAJECTORY TW.10 (115)

| TIME | RANGE | | | |
|----------------|--------|-----------------|--|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMT) | (NHI) | (FT/SEC) | (DE6) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.300 |
| 2.000 | 0.000 | .004 | 35,900 | |
| 4.000 | 0.000 | 024 | 85,000 | 90,000 |
| 6,000 | 0.000 | .061 | 135,800 | 90,000 90,000 |
| 8,000 | 0,000 | 114 | 188 300 | 90,000 |
| 10,000 | .005 | 185 | 243 000 | 90,000 84,128 |
| 12,000 | .015 | 273 | 299 800 | 82,554 |
| 14,000 | 031 | 380 | 358,900 | 80 949 |
| 16,000 | ,053 | 567 | 420,400 | 79,329 |
| 18,000 | .082 | .653 | 484,000 | 77,706 |
| 20,000 | .121 | 818 | 550,600 | 76,091 |
| 22,000 | .170 | 1.004 | 619,300 | 74,494 |
| 24,000 | .230 | 1,211 | 691,000 | 72,914 |
| 26,000 | .304 | 1,439 | 765,600 | 71, 363 |
| 28,000 | 392 | 1,689 | 843 300 | 69 843 |
| 30,000 | 496 | 1 961 | 924 000 1005 600 1089 200 1174 500 | 68 357 |
| 32,000 | 617 | 2,254 | 1005 60C | 66 904 |
| 34,000 | 756 | 2,569 | 1089 200 | 65,488 |
| 36,000 | 914 | 2 907 | 1174 500 | 64 106 |
| 30,000 | 1,093 | 3,265 | 1262 100 | 64 106 62 758 |
| ~ U_U00 | 1,295 | 3 645 | 1352 400 1447 100 | 61 444 |
| 42,000 | 1,519 | 4.047 | 1447 100 | 60 166 |
| **_000 | 1,768 | 4,4/2 | 1544 900 | 60 166 58 922 |
| 46,000 | 2.044 | 4 918 5 388 | 1544 900 1647 300 1754 500 | 57,717 |
| 48,000 | 2,347 | 5 388 | 1754 500 | 56°548 |
| 50,000 | 2,680 | 5,882 | 1000.000 | 56 548 55 418 |
| 52,000 | 3.044 | 6,400 | 1984 500 | 54 325 |
| 54,000 | 3,441 | (i 944 7 513 | 2108 300 | 53,272 |
| 56,000 | 3,873 | 7,513 | 2238 500 | 52,256 |
| 58,000 | 4,341 | 8,109 | 2375 200 | 51,279 |
| 60,000 | 4.849 | 8,733 | 2108 300 2238 500 2375 200 2518 700 | 50 339 |
| 62,000 | 5,397 | 9,386 | 2669 400 | 50 339 49 437 |
| 64,000 | 5,989 | 10.069 | 2827 300 | 48,571 |
| 66,000 | 6,625 | 10.782 | 2992 700 | 47,715 |
| 68,000 | 7,310 | 11,526 | 3165,900 | 46 835 |
| 70,000 | 8,047 | 12,302 | 3347 100 | 45,938 |
| 72,000 | 8,837 | 13,110 | 3536 500 | 45,032 |
| 74.000 | 9,686 | 13,950 | 3734,400 | 44,121 |
| 76.000 | 10,595 | 14,821 | 3941,100 | 43,204 |
| 78,000 | 11,568 | 15,726 | 4156 800 | 42,282 |
| 80,000 | 12,609 | 16,662 | 4381 900 | 41,350 |
| 82,000 | 13,722 | 17,631 | 4616 600 | 40,403 |
| 84,000 | 14,911 | 18,632 | 2518 700 2669 400 2827 300 2992 700 3165 900 3347 100 3536 500 3734 400 3941 100 4156 800 4381 900 4616 600 4861 200 | 39,431 |

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| | | ጥሕ | BLE 17. | (00 | waren e | | |
|--------------------|---|----|------------------|-----|--|-------------|--|
| TIME | DANGE | ın | DLC I/. | ı | MT'_} | | |
| FROM | RANGE | | | | | | |
| LAUNCH | FROM | | | | | | PATH |
| (SEC) | LAUNCH | | ALTITUS! | | VELOCITY | • | ANGLE |
| 86.000 | (NMI) | | (NMI | | (FT/SEC) | | (DEG) |
| 88,000 | 16.179 | | 19.66 | | 5116.100 | | 38.422 |
| 90,000 | 17,533 | | 20.72 | | 5381 300 | | 37.365 |
| 92,000 | 18 976 20 515 22 155 | | 21,813 | | 5381 300 5657 100 5943 600 | | 36 243 |
| 94 000 | 50,212 | | 55,95 | 5 | 5943 600 | | 35 038 |
| 96,000 | 55,155 | | 24 05 | 7 | 6240 200 | - | 33,727 |
| 98,000 | 23 904 25 767 | | 25,204 | 4 | 6546 000 | • | 32,287 |
| 100.000 | 25,767 | | 26,356 | 6 | 6859 600 | 7 | 20, |
| 102-000 | 27.752 | | 27.505 | 5 | 7179.500 | 2 | 0 693 8 931 |
| 104-000 | 29.864 | | 28.638 | | 7502.300 | | 6.971 |
| 106.000 | 32-109 | | 29.740 | 0 | 7824.200 | | |
| 108.000 | 34.489 | | 30.791 | Ĭ | 8139.300 | | 4.793 |
| 110-000 | 37.006 | | 31.771 | l | 8439.500 | | 2.373 9.685 |
| 110.000 112.000 | 39.555 | | 32•654 | • | 8715.300 | | |
| 114.000 | 42.429 | | 33.413 | | 8969.500 | | 6.713 |
| 116.000 | 45.322 | | 34.028 | | 9238.900 | | 3.501 |
| 118.000 | 48.338 | | 34,487 | 7 | 9554.600 | | 0•199 6 • 963 |
| 120-000 | 51.599 | | 34.792 | ? | 9985.000 | | 3 . 998 |
| 122-000 | 54.931 | | 34.948 | 3 | 10503.000 | | 1.383 |
| 124.000 | 58.451 | | 34.963 | } | 11121-100 | | |
| 1244000 | 62•188 | | 34 • 849 |) | 11841-300 | | ••811 2•525 |
| BURN-OUT | OF STAGE | | | | | | C • 2 C 2 |
| | O. STAGE | 1 | AT | | | | |
| 125.400 | 64.931 | | 24 700 | | | | |
| | | | 34.708 | | 12145.400 | •3 | 3.166 |
| | | | | | | | |
| 126.000 | 66,116 | | 24 (41 | | • • • • • | | |
| 128,000 | 70.068 | | 34.641 | | 12145,600 | -3 | 3.237 |
| 130 000 | 74 019 | | 34,407 | | 12146 200 12146 981 | | 468 |
| 132,000 | 77 949 | | 34,157 | | 12146 981 | - | 1400 |
| 134,000 | 74 019 77 969 81 919 | | 33,891 | | 12147 700 | _3 | 930 |
| 136,000 | 85 869 | | 33,609 | | 12148 600 | _4 | 161 |
| 138,000 | 89 818 | | 33,311 | | 12149 400 | -4 | 930 161 393 624 855 086 |
| 140,000 | 89 818 93 766 | | 32,996 | | 1 <i>2</i> 130 350 | -4 | 624 |
| 142,000 | 97.713 | | 32,666 | | 1512T 000 | -4 | 855 |
| 144,000 | 101.660 | | 32,320 | | 2151,819 | -5 | 086 |
| 140,000 | 105,606 | | 31,957 | 4 | 2151 819 2152 300 | - 5 | 317 |
| 148,000 | 109 550 | | 31,578 | | 5125 181 | - 5 | 317 548 |
| 120 000 | 101.860 105.606 109.550 113.494 117.436 121.378 125.316 129.253 133.187 137.119 141.049 | | 31,184 |] | 2152 781 2152 700 2152 656 2151 900 2151 133 2149 200 2146 900 | -5 | . /78 |
| 125,000 | 117,436 | | 30,773 | | 2126.056 | -6 | _010 |
| 124 000 | 121.378 | | 30.346 29.902 | 7 | C121 A00 | -6 | _240 |
| 156,000 | 125.316 | | 29,445 | 1 | 5121 133 | -6, | .470 |
| 158,000 | 129 253 | | 28,970 | 1 | 2144 800 | -6, | 702 |
| 100,000 | 133,187 | | 28,480 | 1 | 2143 700 | -6 | . 932 |
| 105 000 | 137 119 | | 27,973 | 1 | 2143 700 2139 600 | • 1, | . 163 |
| 164,000 | 141 049 | | 27,451 | 1 | 2134,200 | -7, | 394 |
| | ▼ | | _, , , , , | 1 | C134 C00 | - 7. | 625 |

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TABLE 17. (CONT'D)

| TIME | RANGE | | | |
|--|--|--------------------------------------|--|-------------------------------|
| FROM | FROM | | | 0474 |
| LAUNCH (SEC) | LAUNCH | ALTITUDE | VELOCITY | PATH |
| 166.000 | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 168.000 | 144.974 | 26.913 | 12127.400 | (DEG) |
| 170 000 | 148,896 | 26.360 | 12118,800 | -7·856 -8.088 |
| 170 000 172 000 | 152,813 | 25,791 | 12108 130 | -8 319 |
| 174,000 | 156 724 168 639 | 25,207 | 12094 900 | _8,319 _8,551 |
| 176.000 | 160 629 164.526 | 25,791 25,207 24,607 | 12078 500 | -8,783 |
| 178-000 | 168.414 | 23.993 | 12058.200 | -9.016 |
| 180-000 | 172.291 | 23.363 | 12033.100 | -9.249 |
| 182.000 | 176-156 | 22.719 | 12002.200 | -9.484 |
| 184.000 | 180.004 | 22.065 | 11964-100 | -9.719 |
| 186_0nn | 183,834 | 21·390 20.705 | 11917-400 | ~9. 955 |
| 188,000 | 187 641 | | 11859,900 | ~10,193 |
| 188 000 190 000 192 000 194 000 | 194,421 | 20,009 | 11789 300 | -10,433 |
| 192,000 | 134,100 | 19 300 18 582 17 855 17 121 | 11702 700 | _10 675 |
| 194,000 | 198 874 | 17 855 | 11596 300 | _10,920 |
| 196,000 | 707 571 | 17,121 | 11465 900 | -11 169 |
| 196 900 198 000 200 000 | 206,129 | 16,382 | 11304 500 | _11_422 _11_682 |
| 200,000 | 209,655 | 15,641 | 11109 100 | -11,682 |
| EVE_U00 | 513,096 | 14,901 | 10874 900 10596 800 | -11,948 |
| 204 000 206 000 | 206, 129 209, 655 213, 096 216, 438 219, 664 222, 757 | 14 165 | • • • • • • | -11 948 -12 224 -12 510 |
| 208,000 | 219,664 | 14 165 13 438 | 9890 500 9890 500 9456 100 8964 500 8420 000 7831 500 7214 500 6586 500 5964 900 | -12.510 |
| 208,000 | 222,757 | 12,723 | 9456 100 | -12 127 |
| 212,070 | FE2 070 | 12.025 | 8964 500 | -13,127 -13,465 |
| 214.000 | 228,470 | 11,350 | 8420 000 | -13,828 |
| 216,000 | 231,058 | 10,702 | 7831 500 | -14,223 |
| 218,000 | 233,450 | 10.085 | 7214.500 | -14.655 |
| 220 000 | 237,636 | 9,501 | 6586 500 | -15 132 |
| 222 000 | 239 412 | 8,953 | 5964 900 | _15_663 |
| CC4 U00 | 241 010 | 8 441 7 964 | 3307 IUU | _16,257 |
| 660 000 | 242 430 | | 4796 200 | _16_924 |
| 220,U00 | 235,450 235,638 237,624 239,412 241,010 242,430 243,684 244,788 | 7,521 | 4265 200 | _17 675 |
| 230,000 | 244 788 | 7.111 | 3777 200 | -18 524 |
| 232.000 | 245.757 | 6,730 6,377 | 3338 100 2947 700 | -17,484 |
| 234 • 000 | 246-606 | 6.048 | | _20.568 |
| 236.000 | 247.349 | 5.740 | 2601 • 700 | -21.792 |
| 238.000 | 247.998 | 5.452 | 2296.300 | - 23•169 |
| 240.000 | 248.565 | 5•18n | 2031-200 | -24.715 |
| 242.000 | 249.063 | 4.923 | 1803.600 | -26.440 |
| 244+000 | 249.501 | 4.676 | 1612.360 1448.900 | -28.347 |
| 246.000 | 249.887 | 4.439 | 1311-100 | -30.437 |
| 248.000 | 250.229 | 4.209 | 1195.600 | -32.706 |
| 250.000 | 250+532 | 3.985 | 1101.400 | *35.140 |
| | | | ******** | -37.718 |

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TABLE 17. (CONT'D)

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TABLE 18. TRAJECTORY T3N.40 (70)

| TIME | RANGE | | | |
|------------------|----------------|----------------|----------------------|--------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| C.000 | 0.000 | 0.000 | | (DEG) |
| 2.000 | 0.000 | •004 | 0.000 35 999 | 90.000 |
| 4,000 | 0,000 | .024 | 35.900 | 90.000 |
| 6.000 | 0.000 | a061 | 85,000 | 90,000 |
| 8.000 | 0.000 | •114 | 135.800 | 90.000 |
| 10.000 | •005 | •185 | 188.300 | 90.000 |
| 12-000 | •015 | •273 | 243.000 299.800 | 84.128 |
| 14.000 | •031 | •380 | 358.900 | 82.554 |
| 16.000 | •053 | •507 | 420.400 | 80.949 |
| 18.000 | . •082 | •653 | 484.00Ò | 79.329 |
| 20.000 | •121 | •818 | 550.600 | 77.706 |
| 22.000 | •170 | 1.004 | 619.300 | 76•09 <u>1</u> 74•494 |
| 24.000 | •230 | 1.511 | 691.000 | 72.914 |
| 56.000 | •304 | 1.439 | 765.600 | 71.363 |
| 28.000 | •392 | 1.689 | 843.300 | 69.843 |
| 30.000 | •496 | 1.961 | 924.000 | 68.357 |
| 32.000 | •617 | 2.254 | 1005-600 | 66.904 |
| 34.000 | • 756 | 2.569 | 1089.200 | 65•488 |
| 36.000 | .914 | 2.907 | 1174.500 | 64.106 |
| 38.000 | 1 • 0 9 3 | 3•265 | 1262-100 | 62.758 |
| 40.000 | 1 • 295 | 3 • 6 4 5 | 1352.400 | 61 • 444 |
| 42.000 | 1.519 | 4+047 | 1447-100 | 60 • 166 |
| 44.000 | 1.768 | 4.472 | 1544.900 | 58.922 |
| 46-000 | 2.044 | 4.918 | 1647.300 | 57.717 |
| 48.000 50.000 | 2.347 | 5.388 | 1754.500 | 56.548 |
| 52.000 | 2.680 | 5.882 | 1866.800 | 55.418 |
| 54.000 | 3.044 3.441 | 6.400 | 1984.500 | 54.325 |
| 56.000 | 3.873 | 6.944 | 2108.300 | 53.272 |
| 58.000 | 4.344 | 7.513 | 2238.400 | 52.135 |
| 60.000 | 4.859 | 8•107 8•725 | 2375.100 | 50.822 |
| 62.000 | 5.422 | 9.365 | 2518.400 2668.800 | 49.380 |
| 64.000 | 6•036 | 10.027 | 2826.300 | 47.847 |
| 66.000 | 6.706 | 10.708 | 2991.200 | 46.247 |
| 68.000 | 7.434 | 11.409 | 3163.700 | 44.598 |
| 70-000 | 8.226 | 12.126 | 3344.600 | 42.912 41.348 |
| 72.000 | 9.078 | 12.868 | 3537.200 | 40.558 |
| 74.000 | 9.989 | 13.640 | 3738.300 | 39.805 |
| 76.000 | 10.960 | 14.444 | 3948.000 | 39.086 |
| 78 • 000 | 11.997 | 15.279 | 4166.800 | 38,400 |
| 80.000 | 13.100 | 16.148 | 4395.000 | 37.746 |
| 82 • 000 | 14.272 | 17.051 | 4633.000 | 37.123 |
| 84 • 000 | 15.518 | 17.989 | 4881.200 | 36.530 |
| | • | | | 0 |

| | | TABLE 18. | (CONT'D) | |
|------------------------|--------------------------------------|------------------|--|------------------|
| TIME | RANGE | | (COMI AD) | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | A1 | _ | PATH |
| (SEC) | (NMI) | ALTITUD | | ANGLE |
| 86.000 | 16.839 | (NMI | (FT/SEC) | |
| 88.000 | 18,239 | 18.96 | • =140.1nn | (DEG) |
| 90 000 | 19.721 | 19,97 | / 5410 200 | 35.964 |
| 90,000 92,000 | 21,300 | 55 15 55 15 | 9 5692 200 | 35.426 |
| 77,000 | 21 290 22 947 | 55_15 | 2 5986°700 | 34 914 34 427 |
| 96 000 | 24 600 | 23, 25 | 8 6295*400 | 33.042 |
| 98 000 | 24 699 | 24,43 | 8 6617 000 | 33 965 |
| 100,000 | 26,547 | 25,666 26,939 | 6954 400 | 33,525 |
| 102,000 | 28 499 30 556 32 726 | 26 93 | 7307 800 | 33,108 |
| 104,066 | 30,356 | 28,269 | 7678 700 | 32,713 |
| 106 000 | 35,726 | 29.644 | ROSE SOO | 32,339 |
| 106,000 108,000 | 35,013 | 31 080 | 8479 000 | 31,985 |
| 110,000 | 30,045 | 32,574 | 8912 200 | 31,651 |
| 112,000 | 35,013 37,424 39,965 42,644 | 34,132 | 9370 300 | 31 651 31 336 |
| 114,000 | 42,644 | 35,757 | 9856 100 | 31 040 |
| 116.000 | 45,467 | 37,452 | 10372 706 | 30, 762 |
| 118,000 | 70,440 | 39,224 | 10923.800 | 30,502 |
| 120,000 | 51,695 | 41.078 | 11514 100 | 30.260 |
| 122,000 | 55 028 58 552 | 43.020 | 12148 900 | 30.034 |
| 124,000 | 30,552 | 45,059 | 12835 100 | 29,826 |
| 32.000 | 62,283 | 47,201 | 13581 200 | E7, 035 |
| BURN-OUT | OF STAGE | • | 12201,500 | 29,460 |
| | UP STAGE | 1 AT | | |
| 125.400 | 45 | | | |
| | 65.011 | 48.760 | 13878.400 | 20 245 |
| | | | | 29.347 |
| 126.000 | 44 9-0 | | | |
| 128.000 | 66.189 | 49.431 | 13869,200 | 35 |
| 138 600 | 70.111 | 51.657 | 13838.600 | 29,299 |
| 148.000 | 89,649 | 62,547 | 13688 869 | 29,139 |
| 158.00 | 109.068 | 73.038 | 13544 000 | 28,327 |
| 158.000 168.000 | 128 • 374 | 83 • 133 | 13544.000 | 27.500 |
| 178.000 | 147.571 | 92.833 | 13403.994 | 26.656 |
| 178 • 000 188 • 000 | 166.666 | 102.140 | 13268,800 | 25.197 |
| 198.000 | 185.663 | 111.056 | 13138.425 | 24.921 |
| 208.000 | 204.567 | 119.583 | 13013-100 | 24.030 |
| 518.000 | 223+383 | 127.782 | 12892.619 | 23.123 |
| 228.000 | 242-115 | 135.475 | 12777.000 | 22.201 |
| 238.000 | 260.768 | 142.843 | 12666.500 | 21.264 |
| 248.000 | 279.347 | 149.828 | 12561.000 | 20.315 |
| 258.000 | 297.855 | 156.430 | 12460.606 | 19.346 |
| 268.000 | 316.298 | 162.652 | 12365.3 ₀₀ 12275.1 ₀₀ | 18.365 |
| 278.000 | 334.679 | 168.494 | 12160 100 | 17.371 |
| | 353.003 | 173.957 | 12190 • 100 | 16.364 |
| | 371.273 | 179.643 | 12110.356 | 15.345 |
| | 389.494 | 183.752 | 12035.800 | 14.313 |
| 308.000 | 407.670 | 188.084 | 11966.581 | 13.270 |
| | - | | 11902.700 | 12.216 |
| | | 74 | | |

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TABLE 18. (CONT'D)

| TIME | | • | , | |
|--------------------|--|--|------------------------|-------------------------------|
| TIME FROM | RANGE | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| 318.000 | (NHI) | (NMI) | (FT/SEC) | (DEG) |
| 328.000 | 4 ² 5 • 805 | 192.042 | 11844.212 | 11.152 |
| 338,000 | 443.901 | 195,625 | 11791,100 | 10.079 |
| 348 000 | 401,964 | 198,835 | 11743 406 | 8 997 |
| 358 000 | 461 964 479 997 498 004 | 201,671 | 11701 100 | 7 909 |
| 358 000 368 000 | 515 988 | 204 134 | 11664 362 | 6 812 |
| 378,000 | 533 954 | 206, 225 | 11633 100 | 5,710 |
| 368 000 | 551 904 | 207,944 | 11607 388 | 4 603 |
| 398 000 | 569°843 | 209,291 | 11587 200 | 3,492 |
| 408 000 | 587 775 605 701 | 210, 268 | 11572 512 | 2 378 |
| 418,000 | 605 701 | 210,872 | 11563 500 | 1,262 |
| 428.000 | 623,629 | 211,105 | 11559 937 | 144 |
| 438,000 | A41 E20 | 210,968 | 11562,000 | 973 |
| 448,000 | 659,495 677,442 695,404 713,382 731,383 749,409 | 210,460 | 11569 644 | -2,089 |
| 458 000 | 677 442 | 209,579 | 11582 900 | -3,204 |
| 400_060 | 695 404 | 208 328 | 11601 588 | -4 _316 |
| 478_00C | 713.382 | 206,705 | 11625 900 11655 731 | -5,424 |
| 400_000 | 731 383 | 204.711 202.344 | 11691,100 | -6,527 -7,625 |
| 470,000 | 749 409 | 199,604 | 11731 887 | - i 625 |
| 508,000 | | 196 492 | 11778 200 | _8,716 |
| 508 000 518 000 | 785 551 | 196,492 193,006 | 11829 881 | _ 7 600 |
| 260 000 | 603.010 | 189,145 | 11887 000 | _10 875 _11 942 |
| 230_000 | 821,840 | 189 145 184 909 180 298 | 11949 531 | 12 998 |
| 548,000 | 840.049 | 180,298 | 12017,400 | -14,044 |
| 558,000 | 858,307 | 175, 310 169, 945 164, 201 158, 078 151, 574 144, 688 | 12090 531 | 15 070 |
| 568 000 | 876,616 | 169 945 | 12168 900 | -15 079 -16 101 |
| 578 000 | 894 982 913 408 | 164,201 | 12252 575 | _17 112 _18 109 |
| 588 000 598 000 | 913,408 | 158 078 | 12341 400 | _18 109 |
| 608.000 | 931 899 | 151,574 | 12435 425 | 19'093 |
| 618-000 | 950.460 | 144.688 | 12534.500 | -20.063 |
| 628.000 | 969-093 | 137.420 | 12638.769 | -21.019 |
| 638.000 | 987•804 1006 508 | 129.766 | 12747.900 | -21.960 |
| 648 000 | 1006,598 | 121.727 | 12862,150 | -22.886 |
| 648 000 658 000 | 1025,479 | 113,301 | 12981 400 | _23 797 |
| 668 000 | 1044,451 1063,520 | 104,400 | 13105,544 | -24 692 |
| 678,000 | 1082,690 | 113.301 104.486 95.280 | 13234 600 | _24 692 _25 571 |
| 000 (00) | 1101,968 | 85 ⁶⁸² | 13368 510 | _26 435 |
| 698,000 | 1121,357 | 75,690 | 13507,300 | - 27,283 |
| / UB _ USO | 1140.863 | 65,301 54,515 | 13650 919 | _28 114 _28 930 _29 730 |
| /38 000 | 1160,493 | 54.515 | 13799 300 | -28 ,930 |
| 'EU_UUU | 1164 433 | 43,328 41,043 | 13952 794 | -29.730 |
| 722,000 | 1168,380 | 38,741 | 13982,500 | 20 888 |
| • | | 200141 | 14015,200 | -30 045 |

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TABLE 18. (CONT'D)

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| TIME | RANGE | | | |
|--|----------------------|------------------|----------------------------------|----------------------------------|
| FROM | FROM | | | 847. |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMT) | (NMI) | (FT/SEC) | ANGLE |
| 724.000 | 1172.330 | 36.424 | | (DEG) |
| 726.000 | 1176,288 | 34,039 | 14042.400 | -30.202 |
| 728,000 | 1180,244 | 31,743 | 14076,194 | -30,357 |
| 730,000 | 1184,212 | 29,375 | 14096 800 | -30,513 |
| 732 000 | 1188 171 | 27,002 | 14133,967 | -30,669 |
| 734 000 | 1188,171 1192,134 | 24,612 | 14134 700 | -30,823 |
| 736,000 | 1196,092 | 55, 513 | 14138,400 | _30_823 _30_978 |
| 734 000 736 000 738 000 740 000 | 1200,035 | 19,809 | 14118 800 14053 100 | -21 125 |
| 740,000 | 1203,944 | 17,413 | 14033,100 | -31,288 |
| 742,000 | 1207 784 | 15 047 | 13896 200 | -31,445 |
| 744 000 | 1211 488 | 15.047 12.751 | 13563 500 | _31_608 |
| 746 000 | 1211 488 1214 951 | 10.590 | 12931 000 | _31 781 |
| 748 000 | 1218,036 | 8 651 | 11847 100 | _31 ,761 _31 ,973 _32 ,203 |
| 746 000 748 000 750 000 752 000 | 1220,623 | | 10262 200 8344 400 | |
| 752 000 | 1222,659 | 7.010 5.702 | 6414 200 | -32 +93 |
| 754,000 | 1224,199 | 5,702 4,695 | 6416 200 | 32,882 |
| 756,000 | 1225,355 | 3,023 | 4845 400 2673 300 | _33,410 |
| 758,000 | 1226,229 | 3,923 3,330 | 3673 300 3835 505 | _34 118 _35 047 |
| 760,000 | 1226,899 | 3.320 | 2829 500 | -35,047 |
| 760.000 762.000 | 1227,419 | 2.840 2.449 | 2214 000 1768 100 1446 900 | <i>∞</i> 36,236 |
| 764.000 | 1227,831 | | 1100,100 | -37,720 |
| 766,900 | 1228,162 | 2,121 | 1440,900 | -39,518 |
| 768,000 | 1228,436 | 1.838 | 1215,500 | -41,629 |
| 770,000 | 1228,673 | 1,584 1,345 | 1068,400 | -44,009 |
| 772,000 | 1228,885 | 1,111 | 985,900 | -46,540 -49,115 |
| 774.000 776.000 | 1229,078 | 878 | 936 500 905 400 | -49,115 |
| 776,000 | 1229,255 | 643 | 703 7 50 | -51,665 |
| 778.000 | 1229,420 | 643 | 885 300 870 700 857 500 | -54,146 |
| 780.000 | 1229.572 | .405 .165 | 970 100 957 500 | -56,530 |
| 781,367 | 1229,669 | | 001,000 846 844 | -58,809 |
| • | 155,001 | 0.000 | 848 817 | -60,303 |

TABLE 19. TRAJECTORY TR. 40 (85)

| TIME | RANGE | | | |
|--------------------------------------|---------|----------|----------|------------------|
| FRCM | FROM | | | DATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | Path Angle |
| (SEC) | (NMI) | (MMI) | (FT/SEC) | (DE6) |
| 0.000 | 0.000 | 0.000 | 0.000 | - |
| 2.000 | 0.000 | .004 | 35,700 | 90.000 |
| 4_000 | 0,000 | 624 | 85,000 | 90.000 |
| 6,000 | 0.000 | .061 | 135,800 | 90,000 |
| 8,000 | 0.000 | .114 | 188,300 | 90,000 |
| 10,000 | .005 | 185 | 243 000 | 90,000 84,128 |
| 10.000 12.000 | .015 | 273 | 299,800 | 82,150 |
| 14 000 | .031 | 380 | 358,700 | 82°554 80°949 |
| 16,000 18,000 20,000 | .053 | 507 | 420,400 | 79 329 |
| 18,000 | 082 | 653 | 484 000 | 77,706 |
| 20,000 | .121 | .818 | 550,600 | 75,091 |
| <i>22</i> _000 | 170 | 1.004 | 619,300 | 74 494 |
| 24,000 26,000 | 230 | 1,211 | 691 000 | 72 914 |
| 26.000 | .304 | 1,439 | 765 630 | 71 363 |
| 28,000 | 392 | 1,689 | 843 300 | 69 843 |
| 30,000 | 496 | 1,961 | 924 000 | 68,357 |
| 28 000 30 000 32 000 34 000 | 617 | 2,254 | 1005 600 | 66 904 |
| 34,000 | 756 | 2,569 | 1089 200 | 65 488 |
| 30,000 | UIA | 2,907 | 1174 500 | 64 106 |
| 38,000 | 1,093 | 3 265 | 1262 100 | 62 758 |
| 40.000 | 1.295 | 3.645 | 1352,400 | 61.444 |
| 42.000 | 1.519 | 42047 | 1447-100 | 60-156 |
| 44.000 | 1.768 | 4.472 | 1544.900 | 58.922 |
| 46-000 | 2.044 | 4.918 | 1647.300 | 57.717 |
| 48.000 | 2.347 | 5.386 | 1754.500 | 56.548 |
| 50-000 | 2•680 | 5•882 | 1866.800 | 55.418 |
| 52.000 | 3.044 | 6.400 | 1984.500 | 54.325 |
| 54.000 | 3.441 | 6.944 | 2108.300 | 53.272 |
| 56.000 | 3.873 | 7.513 | 2238.400 | 52.135 |
| 58-000 | 4.344 | 8-107 | 2375-100 | 50.822 |
| 60.000 | 4.859 | 8.725 | 2518.400 | 49.380 |
| 62.000 | 5.422 | 9•365 | 2668.800 | 47.847 |
| 64.000 | 6.036 | 10.027 | 2826.300 | 46.247 |
| 66.000 | 6.706 | 10.708 | 2991.200 | 44.598 |
| 68.000 | 7.434 | 11.409 | 3163.700 | 42.912 |
| 70.000 | 8 • 226 | 12-126 | 3343.900 | 41.194 |
| 72.000 | 9.085 | 12.858 | 3531.900 | 39.447 |
| 74.000 | 10.015 | 13.602 | 3727.900 | 37.672 |
| 76.000 | 11.020 | 14.357 | 3931.900 | 35.866 |
| 78.000 | 12.104 | 15-118 | 4143.900 | 34.027 |
| 80.000 | 13.270 | 15.882 | 4364.000 | 32 • 148 |
| 82.000 | 14.524 | 16.645 | 4592.000 | 30 • 225 |
| 84.000 | 15•868 | 17•402 | 4827.800 | 28.249 |
| | | | | |

| •• | | TABLE 19. (| COM 'D) | |
|-------------------------------|---|------------------|---|------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (AMI) | (MMI) | (FT/SEC) | (986) |
| 86•900 88 _• 000 | 17.306 | 18-151 | 662.288 | 26.627 |
| 90,000 | 18,838 | 18,938 | 5359 100 5649 100 | 25,732 |
| 92,000 | 20 462 22 181 23 998 | 19,686 | 5649 100 | 25 160 |
| 94,000 | 55,181 | 20,489 | 5951 500 | 24 619 |
| 96,000 | 25,798 | 21,318 | 6267 200 | 24 106 |
| 98,000 | 25,918 27,945 | 22,174 | 6397 100 | 23,620 |
| 100 000 | 27,945 | 23,059 | 6943,400 | 23,160 |
| 100,000 102,000 | 30 085 32 341 | 23,973 | 7384,388 | 22,725 |
| 104,000 | 32,341 34,721 | 24,917 | 1094 180 | 22,315 |
| 106,000 | 37, 229 | 25,894 | 505<,000 | 21,927 |
| 105,000 | 39,873 | 26,905 | 8381 688 | 21,562 |
| 110,000 | 42,659 | 27,951 29,036 | 8943,700 | 21,219 |
| 112,000 | 45,595 | 29,036 30,162 | 9410,700 | 20,896 |
| 114.000 | 48,691 | 31,331 | 7705 JOO | 20,594 |
| 116,000 | 52,063 | 32,547 | 10930,700 | 20,312 |
| 118,000 | 55,523 | 33,813 | 8943 700 9410 700 9905 300 10430 900 10991 000 11590 400 | 20,049 |
| 120,000 | 59,177 | 35,134 | 12234 400 | 19,806 |
| 122,000 | 63,040 | 36,514 | 12234,400 12929,800 | 19,581 |
| 124.00C | 67.128 | 37,959 | 13685,200 | 19,374 |
| BURN-OUT | OF STAGE | 1 AT | | 19,186 |
| 125.400 | 70.118 | 39.008 | 13988.900 | 19.064 |
| 126.000 | 71.409 | 30 (50 | • | |
| 128,000 | 75.709 | 39.458 | 13982.400 | 19.012 |
| 130,000 | 80 005 | 40.950 | 13961,000 | 18,840 |
| 132,000 | 80,005 84,297 | 42,426 | 13940 100 | 18,667 |
| 134,000 | | 43,887 | 13919 600 13899 500 | 18,494 |
| 136,000 | 92 871 | 45,333 | 13899,500 | 18,320 |
| 138,000 | 97.153 | 46,763 | 13879 700 13860 200 13840 950 13821 900 | 18,146 |
| 140,000 | 101.431 | 48,179 | 13860,200 | 17,971 17,796 |
| 142,000 | 105.705 | 49,578 50,963 | 13040,950 | 17,796 |
| 125,000 | 127,028 | 50.963 57.660 | 13021 400 | 17,621 |
| 102 060 | 148,272 | 63.978 | 13729 675 13642 500 | 10,135 |
| 172,000 | 169 442 | 69 918 | 13560 275 | 15,841 |
| 172 000 182 000 | 190,543 | 69 918 75 482 | 13483 200 | 14 936 14 021 |
| 176,000 | 211,579 | 80,671 | 13411 056 | 13 007 |
| 202,000 | 92.871 97.153 101.431 105.705 127.028 148.272 169.442 190.543 211.579 232.555 253.477 | 85,486 | 13411,056 13344,000 | 13,097 |
| 212,000 | 253,477 | 89,927 | 13281 944 | 12,164 |
| 232,000 | 274,348 | 93,994 | 13225,000 | 11,222 |
| 232.000 | 295,174 | 97,690 | 13173,250 | 10°273 9°317 |
| 242 000 252 000 | 253,477 274,348 295,174 315,958 336,705 | 101,015 | 13126 500 | 9°317 8°354 |
| , 000 | 330,105 | 103,968 | 13084 981 | 7.386 |
| | | | • | • - |

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TABLE 19. (CONT'D)

| T7 | | - 1 | J, | |
|--------------------|---|-----------------------------|------------------------|---|
| TIME FROM | RANGE | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| 262.000 | (NMT) | (MMI) | (FT/SEC) | (DE6) |
| 272,000 | 357-421 | 106.551 | 13048.600 | 6.411 |
| 282,000 | 378,168 398 772 | 168,764 | 13017,356 | 5,432 |
| 292,000 | 410 416 | 110,608 | 12991 306 | 4.450 |
| 302,000 | 398 772 419 416 449 846 460 664 481 277 581 887 522 489 | 112,082 | 12970 531 | 3,463 |
| 312,000 | 460 664 | 113,188 | 12954 999 | 2,476 |
| 322,000 | 481 277 | 113,924 | 12944 458 | 1,485 |
| 332,000 | 501 887 | 114,292 | 12939 200 | .494 |
| 342.000 | 522.499 | 114,291 | 12939 250 | - 498 |
| 352.000 | 543-118 | _ | 12944,596 | _1,459 |
| 362-000 | 563.747 | 113:184 | 12954.906 | ~2.480 |
| 372.000 | 584.391 | 112• 0 77 110•601 | 12970-600 | ~3.468 |
| 382.000 | 605.055 | 108.756 | 12991 • 381 | *4.454 |
| 392,000 | 625,742 | 106,541 | 13017,500 | -5.437 |
| 402,000 | 645,458 | 103,957 | 13048,731 13685,100 | -6,415 -7,389 -8,358 |
| 412,000 | 667,206 | 101.002 | | -7,489 |
| 422,000 | 687,990 | 97,676 | 13126,706 13173,400 | |
| 432,000 | 708 8 16 | 93,979 | 13225 256 | -9.321 |
| 442,000 | 729 687 | 89 909 | 13282,500 | -10,278 |
| 452,000 | 750 609 | 85,467 | 13344 225 | -11,550 |
| 462,000 | 729 687 750 609 771 586 792 622 813 723 | 80 651 | 13411 300 | -9.321 -10.278 -11.226 -12.168 -13.101 -14.025 -14.940 -15.845 -16.740 -17.624 |
| 4/2,000 | 792,622 | 75,461 | 13483 469 | 14 025 |
| +02,000 | 813,723 | 69,895 | 13560 600 | 14 940 |
| 492,000 | 034,594 | 63,952 | 13642 825 | 15 445 |
| 502,000 | 856 138 877 461 | 57,633 | 13729 900 | 16 740 |
| 512,000 | 877,461 | 50,935 | 13822 025 | 17 624 |
| 522,000 | 898,868 903,160 907,455 911,754 | 43 858 | 13918 300 | 18 498 |
| 524 000 | 903,160 | 43 858 42 396 | 13938 137 | _18_671 |
| 526,000 | 907,455 | 40 920 | 13957°300 | 18 844 |
| 528,000 | 911,754 | 40 920 39 428 | 13977 237 | 19 014 |
| 530,000 | 916 055 920 361 924 668 | 37,922 | 13995 700 | 10 100 |
| 532,000 | 920,361 | 36,400 | 14015 525 | _19 360 _19 531 |
| 534,000 | 924,668 | 34,864 | 14032 100 | -19°531 |
| 536,000 | ASO ABO | 33,311 | 14050 862 | -19,701 |
| 538.000 | 933.292 | 31.746 | 14063.900 | -19.872 |
| 540.000 | 937.611 | 30•165 | 14080.267 | -20.042 |
| 542.000 | 941.921 | 28.570 | 14085.500 | -20.515 |
| 544.000 | 946.236 | 26.962 | 14089.300 | -20.382 |
| 546.000 | 950.547 | 25.340 | 14085.200 | -20.552 |
| 548.000 | 954.853 | 23.707 | 14068.800 | -20.722 |
| 550.000 552.000 | 959.149 | 22.004 | 14032.500 | -20.893 |
| 554.000 | 963.426 | 20.414 | 13964.600 | -21.064 |
| JJ44000 | 967.672 | 18•762 | 13846.600 | -21 • 238 |
| | | | | |

TABLE 19. (CONT'E)

| TIME | RANGE | | | |
|---|-------------------------------|-------------------------|---|--------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | Ai TTTune | 11 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | PATH |
| (SEC) | (AMI) | ALTITUDE | AEFOCITA | ANGLE |
| 556-000 | 971-868 | (NMI) | (FT/SEC) | (D£6) |
| 558.000 | 975,983 | 17-115 | 13648.900 | -21.415 |
| 560,000 | 979 973 | 15.486 | 13329,500 | -21,599 |
| 562 00¢ | 983 779 | 13,892 | 12841 300 | -21,791 |
| 564 000 | 979,973 983,779 987,325 | 12,357 | 12131 600 | -55,000 |
| 566,000 | 990.537 | 10,911 | 11100 100 | -55,535 |
| 568 006 | 993 354 | 9.586 | 9965_100 | -22,499 |
| 570,000 | 905 744 | 8.408 7.391 | 5699 <u>,</u> 000 | _22 B17 |
| 572 000 | 995,744 997,716 | 7,391 | 7208 700 | -23,205 |
| 574 000 | 999 315 | 6,534 | 5904 100 | _23 689 |
| 576 000 | | 5,822 | 4780 500 | -24, 295 |
| 562,000 564,000 566,000 568,000 570,000 572,000 574,000 576,000 578,000 | 1000 601 | 6 534 5 822 5 231 | 3866 200 | -25 052 |
| 580 000 | 1001,638 | 4,736 | 3150 400 | _25_052 _25_988 |
| 582,000 | 1002 479 1003 166 | 4,316 | 2591 400 | 27 128 |
| 584.000 | 1003,168 | 3,954 | 2150 100 | 28 497 |
| | 1003,731 | 3,637 | 1804.000 | 30.121 |
| 586.000 | 1004-200 | 3•355 | 1536.900 | |
| 588-000 | 1004.594 | 3.098 | 1328-200 | *32·010 |
| 590.000 | 1004-927 | 2.862 | 1167-100 | *34 • 166 |
| 592.000 | 1005+215 | 2.638 | 1057.700 | -36.576 |
| 594-000 | 1005•470 | 2.419 | 989.800 | -39-195 |
| 596 • 000 | 1005 • 701 | 2.501 | 946.200 | *41.931 |
| 598.000 | 1005.914 | 1.981 | 917-300 | -44.699 |
| 600-000 | 1006-111 | 1.756 | 898.000 | -47.439 |
| 602-000 | 1006-293 | 1.527 | 884.900 | -50.111 |
| 604-000 | 1006-464 | 1.293 | 876.000 | -52.687 |
| 606-000 | 1006•623 | 1:054 | 869.800 | -55.148 |
| 608-000 | 1006.772 | •810 | 862.800 | -57.486 |
| 010.000 | 1006.910 | . 563 | 863.8 ₀₀ | -59.698 |
| 612.000 | 1007-039 | •313 | 857.4 ₀₀ | -61.787 |
| 614.000 | 1007-158 | •061 | 850 • 500 | ··63·759 |
| 614.488 | 1007-185 | 0.000 | 843.000 | -65.618 |
| | - · • • | 0-000 | 841.048 | -66.055 |
| | | | | |

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All Parket

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| TIME | TABLE 20. Range | TRAJECTORY | TM.40 (90) | |
|------------------|--------------------|-------------------------|--|--------------------|
| FROR | FROM | | | 047 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (1661) | | ANGLE |
| 0.000 | 0.000 | 0.000 | (FT/SEC) | (D£6) |
| 2.000 | 0.000 | .004 | 9,006 25,000 | 90.00 |
| 4.000 | 0.000 | .024 | 35,900 | 90,000 |
| 6,000 | 0.000 | .061 | 85,000 | 90,000 |
| 8,000 | 0.000 | ,114 | 135,800 | 90,000 |
| 10,000 | | 185 | 188,300 | 90,000 |
| 12,000 | .005 .215 | 273 | 243 000 | 84 128 |
| 14,000 | .031 | 380 | 299,880 | 82,554 |
| 10,000 | .053 | 507 | 358,900 | 80 949 |
| 18.000 | .082 | 653 | 420 400 | 79 329 |
| 20,000 | .121 | .818 | 484 000 850 444 | 77,706 |
| 55,000 | 170 | 1 004 | 550 600 | 76 091 |
| 24 _000 | 230 | 1.004 1.211 | 619 300 | / * 494 |
| 20,000 | 304 | 1,439 | 691 000 | 72,914 |
| 20_U 00 | 392 | 1,689 | 765 600 | 71,363 |
| 30_000 | 4.96 | 1,961 | 843 300 924 000 | 69,843 |
| 32,000 | 617 | 2,254 | 924 000 | 68,357 |
| 34 _000 | 756 | 2,569 | 1005 600 | 66 904 |
| 36,000 | 914 | 2 907 | 1089 200 | 65,488 |
| 30,000 | 1,093 | 2 907 3 265 3 645 | 1262 186 | 64,106 |
| ~ U_U_U_U | 1 295 | 3.645 | 1352 440 | 62,758 |
| 42.000 | 1.519 | 4.047 | 1174 500 1262 100 1352 400 1447 100 | 61 444 |
| 44.000 | 1.768 | 4:472 | 1544 9 | 60,166 |
| 46.000 | 2.044 | 4.918 | 1544.900 | 58.922 |
| 48-000 | 2.347 | 5.388 | 1647.300 | 57.717 |
| 50.000 | 2.680 | 5.882 | 1754-500 | 56.548 |
| 52.000 | 3.044 | 6,400 | 1866.800 | 55.418 |
| 54.000 | 3.441 | 6.944 | 1984.500 | 54.325 |
| 56.000 | 3.873 | 7.513 | 2108.300 | 53.272 |
| 58-000 | 4.344 | 8.107 | 2238.400 2375.100 | 52.135 |
| 60 • 000 | 4 • 859 | 8 • 725 | 2518•400 | 50.822 |
| 62.000 | 5.422 | 9.365 | 5999-800 | 49.380 |
| 64-000 | 6.036 | 10:027 | 2826.300 | 47.847 |
| 66• გიი | 6.706 | 10.708 | 2991• <u>2</u> 00 | 46.247 |
| 68.000 | 7.434 | 11.409 | 3163.700 | 44.598 42.912 |
| 70.000 | 8.226 | 12.126 | 3343.900 | |
| 72-000 | 9.085 | 12.858 | 3531.900 | 41.194 |
| 74.000 | 10.015 | 13.602 | 3727.900 | 39•447 37•672 |
| 76.000 | 11.020 | 14.357 | 3931.900 | |
| 78.000 | 12.104 | 15-118 | 4143.900 | 35.866 34.037 |
| 80.000 | 13.270 | 15.882 | 4364.000 | 34•027 32•148 |
| 82.000 | 14.524 | 16.645 | 4592.000 | |
| 84.000 | 15.868 | 17.402 | 4827.800 | 30•225 28•249 |
| | _ | - , , , , | 4-E-4-00 | 20+247 |

| | T | ABLE 20. (CO | MT'D) | |
|--|---|--|------------------------|------------------|
| TIME | RANGE | | | |
| FROM | | | | |
| LAUNCH | FROM | AL TYTURE | WEL BATTY | PATH |
| (SEC) | (NHI) | ALTITUDE (NMI) | VELOCITY | ANGLE |
| 86.000 | 17.307 | | (FT/SEC) | (DEG) |
| 88.000 | 18.844 | 18.147 18.874 | 5071.000 5321,200 | 26.210 |
| 90,000 | 20 484 | 19,575 | 5582 700 | 24.098 22.035 |
| 90,000 92,000 | 20 484 22 227 24 074 | 20 263 | 5883 300 | 22,035 20,888 |
| 94,000 | 24 074 | 20,962 | 6202,500 | 20,309 |
| 96,000 | 26,027 | 21,681 | 6536 000 | 19 805 |
| 98 000 | 28,090 | 22,420 | 6885 100 | 19,328 |
| 100,000 | 28,090 30,269 | 23,181 | 7249°700 | 18,962 |
| 102,000 | 32,262 | 23,972 | 7632 700 | 18,543 |
| 104,000 | 34,989 37,544 | 24,779 | 8034 500 | 18 138 |
| 106,000 | 37,544 | 25,616 | 8457 100 | 17,762 |
| 108,000 | 40,230 | 26,479 | 8902 300 | 17,408 |
| 110.000 | 8.5 D7Y | 27,370 | 9372 600 | 17,076 |
| 116,000 | 40,073 | 28,292 | 9870 500 | 16,765 |
| 92 900 94 000 96 000 100 000 102 000 104 000 108 000 110 000 112 000 114 000 116 000 | 46 073 49 230 52 671 56 201 | 29,245 | 10399 300 | 16,475 |
| 118,000 | 56 201 | 30,234 | 10962,700 | 16,205 |
| | 26.501 | 31,260 | 11565 300 | 15,954 |
| 120,000 122,000 | 59,930 63,872 | 32,328 | 12212,500 | 15,723 |
| 124,000 | 68.047 | 33,441 34,603 | 12911 100 | 15,512 |
| <u>•</u> | • | 34,603 | 13669,600 | 15,319 |
| DUKN-UU! | OF STAGE | 1 AT | | |
| 125.400 | 71.100 | 35.444 | 13975,600 | 15,194 |
| 126.000 | 72.418 | 25.005 | 12049 800 | 16 1/1 |
| 128.000 | 76.809 | 35.805 36.998 | 13969.800 | 15.141 |
| 130,000 | 81,196 | 38,176 | 13950.800 13932.700 | 14,964 |
| 132,000 | 85,580 | 39,339 | 13915,200 | 14,787 |
| 134.000 | 89,961 | 40.487 | 13898 300 | 14,609 14,431 |
| 136,000 | 94.338 | 41,619 | 13881 900 | 14, 253 |
| 138,000 | 94.338 98.712 | 42,737 | 13866,000 | .0/4 |
| 140,000 | | 43,839 | 13850.400 | 1,895 |
| 142 000 | 107.452 | 44,926 | 13835,100 | 13,716 |
| 144.000 | 111,818 | 45,999 | 13820_100 | 13,536 |
| 146,000 | 116,181 | 47,056 | 13805 387 | 13,356 |
| 148,000 | 120,541 | 48,098 | 13790_900 | 13,176 |
| 144 000 146 000 148 000 150 000 152 000 162 000 172 000 | 103.084 107.452 111.818 115.181 120.541 124.899 129.254 150.993 172.674 194.302 215.882 | 48,098 49,125 | 13776_656 | 12 995 |
| 125.000 | 127,254 | 50,137 | 13762 600 13695 650 | 12,813 |
| 172 000 | 130,743 173 474 | 34,973 50 434 | 13042 020 | 11,902 |
| 182,000 | 115,014 | 37,430 63 834 | 13033.700 | 10.984 |
| 192,000 | 215 842 | 67 241 | 13577 131 | 10,058 |
| 505,000 | 237 418 | 70 585 | 13525 500 13478 925 | 9,125 |
| 212,000 | 237 418 258 916 | 50 137 54 973 59 436 63 524 67 241 70 585 73 558 | 13437 500 | 8 186 7 242 |
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TABLE 20. (CONT'D)

| TIME | 2444- | | | |
|--------------------|---|-------------|---|--|
| FROM | RANGE | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | |
| 255.000 | (NHT) | (NMI) | (FT/SEC) | ANGLE |
| 232.000 | 280.380 | 76-161 | 13401.175 | (026) |
| 242 000 | 301,815 | 78,393 | 13370 068 | 6.292 |
| 242,000 | 323,224 | 80,255 | 13343 925 | 5,338 |
| 252 000 | 323 224 344 613 365 987 387 348 408 703 | 81,747 | 13343 925 13323 100 13307 356 13296 800 13291 331 | 4 380 |
| 262,000 | 365,987 | 82,871 | 13307 356 | 3,419 2,456 |
| 272.000 282.000 | 357,348 | 83,625 | 13296 800 | 2,436 |
| 292.000 | +08,763 | 84.009 | 13291.331 | 1,491 |
| 292.000 | 430•05 6 | 84.025 | 13291 • 200 | .525 |
| 362.000 | 451.410 | 83-672 | 13296-125 | -•441 |
| 312-000 | 472•772 | 82.950 | 13306.500 | ~1.407 |
| 322.000 | 494 • 144 | 81 -859 | 13390.500 | *2•373 |
| 332.000 | 515 521 | 80.398 | 13321-519 | *3•336 |
| 342,000 | 536 939 558 371 579 832 601 327 622 860 | 78,569 | 13341.900 13367.550 | -4,297 |
| 352.000 | 558,371 | 76,368 | 13367 550 | -5,255 |
| 362.000 | 579.832 | 73,798 | 13398 300 | -6,210 |
| 372,000 | 601,327 | 70,857 | 13434 156 | -7,159 |
| 382,000 | 622,860 | 67,544 | 13475 100 13521 225 | -8,105 -9,044 |
| 392,000 | 644 436 | 63,860 | 13572 400 | -9.044 |
| 402.000 | 666,060 | 59,803 | 13628 631 | -9 ,978 |
| 412,000 | 687,736 | 55,374 | 13690 000 | -10 905 |
| 422,000 | 666.060 687.736 709.469 731.264 | 50 570 | 13756 237 | _11 824 _12 736 |
| 432,000 | 731,264 | 45,392 | 13827 000 | -12,/36 |
| 434,000 | 735 631 740 000 | 44,311 | 13827 000 13841 744 | -13,638 |
| 436,000 | 740.000 | 43,215 | 13856 400 | -13,818 |
| 438,000 | 744 372 748 746 753 124 757 503 761 886 | 42,105 | 13856 400 13871 344 | -13, 997 |
| 440,000 | 748,746 | 40.979 | 13885 900 | -14,176 |
| 442 000 | 753 124 | 39 838 | 13900 875 | -14 355 |
| 444.000 | 757,503 | 38,683 | 13915 200 | _14_533 |
| 446,000 | 761,886 | 37,512 | 13929 994 | -14,711 |
| TTO UND | 766,270 | 36,326 | 13943 400 | -14 888 |
| 730 UNII | 766 270 770 658 775 045 779 437 783 827 | 35,125 | 13957 713 | 15 066 15 243 15 419 15 595 15 772 15 948 |
| 7JE . UIIII | 775.045 | 33,911 | 13969 500 | -15,243 |
| | 779,437 | 32,680 | 13982 363 | -15,419 |
| 450,000 | 783 827 | 31 436 | 13991 200 | -15,595 |
| 456 000 458 000 | 788 222 792 611 | 30,176 | 14001 567 | -15,7/2 |
| 7 V V . U I I I I | 792,611 | 28,904 | 14004 700 | -15,948 |
| 702 000 | 797 002 801 390 | 27,617 | 14004 700 14006 400 | T. V. A. L.J |
| 707 . UNB | 801.390 | 26,317 | 14000 500 | -10,599 |
| 400.000 | 003,774 | 25.003 | 14002 800 13991 900 | -10,4/5 |
| 400 NAA | 810,150 814,515 | 23,678 | 13971 700 | -10.050 |
| *'V.UNO | 814,515 | 22.342 | 13970 200 13932 600 | -16,827 |
| 712 UNA | 818.862 | 20,996 | 13872 000 | -1/_003 |
| 474.000 | 823 183 | 19,645 | 13872 000 13777 600 | -17 181 -17 361 |
| | • | - · • · · · | *3111,000 | -1/,36] |

TABLE 20. (COMT'D)

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| TIME | RANGE | | | |
|-------------------------------|--|----------------|---|---|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TITUDE | 1101 0 - 2 - | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 476-000 | 827-465 | (NMI) | (FT/SEC) | (DEG) |
| 478.000 | 831.685 | 18.292 | 13634.000 | -17.544 |
| 480 000 | 835 828 | 16,942 | 13418,800 13104,900 | -17.73ŏ |
| 482 000 | 839 847 | 15,605 | 13104 900 | _17 923 |
| 484 000 | 843 703 | 14,291 | 12665 300 | -18 126 |
| 486 000 488 000 490 000 | 835 828 839 847 843 703 847 342 | 13,016 | 12070 100 | _18_126 _18_343 _18_579 _18_843 |
| 488 000 | 850 711 | 11,797 | 11299 600 | _18 579 |
| 490,000 | 850 711 853 741 | 10,652 | 10355 400 | _18 843 |
| 492,000 | 853,761 856,456 | 9,600 | 10355,400 9277,400 8116,300 | -17 145 |
| 494,000 | 856 456 858 785 | 8,653 | 8116,300 | _19 499 |
| 496,000 | 860,758 | 7,817 | 6952~900 | -19 920 |
| 498 000 | 862 416 | 7.817 7.091 | 5867 500 | _19 499 _19 920 _20 427 _21 040 |
| 498 000 500 000 502 000 | 862,410 | 0.403 | 4907 600 | _21 040 |
| 502 000 | 864 017 | 5,927 | 4083 200 3401 700 | -21 782 |
| 504 000 | 863,782 864,917 865,859 866,645 | 5 927 5 463 | 3401 700 | _22,677 |
| 504 000 506 000 508 000 | 864 645 | 5,059 | 2854 300 | _23°748 |
| 508 000 | 867 202 | 4,703 | 2409 500 | 25°014 |
| 510 000 | 867 303 867 857 | 4,703 4,386 | 2047 400 | _23 748 _25 014 _26 496 |
| 510,000 512,000 | 061,651 | 4.099 | 1756 600 | 28 213 |
| 514,000 | 868 327 | 3,837 | 1524 700 1338 200 1189 700 | -30,170 |
| 516 000 | 868,728 | 3,593 | 1338 200 | -32,369 |
| 516,000 | 869,074 869,374 | 3,364 | 1189 700 | -34,796 |
| 518,000 | 869,374 | 3,145 | 1079 700 | -37 422 |
| 520 000 522 000 524 000 | 869.641 | 2.930 2.715 | 1008,700 952,400 931,300 910,100 | -37,422 -40,172 |
| 524 000 | 970 106 | 2,715 | 952 400 | -42 966 |
| 526 000 | 970,100 | 2,498 | 931 300 | -45°745 |
| 526 000 528 000 | 869 883 870 106 870 312 870 503 | 2,276 | 910,100 | .42 966 .45 745 .48 465 .51 096 .53 619 |
| 530 000 | 070,503 | 2,049 | 895,500 | 51 096 |
| 530 000 532 000 | 010.085 | 1,817 | 885 500 878 500 873 600 | -53 619 |
| 534.000 | 870 949 | 1,580 | 878 500 | -56 022 |
| 536 000 | 871.006 | 1,338 | 873,600 | -58,299 |
| 536,000 | 871,152 | 1.091 | 869,900 | -60 449 |
| 538 000 | 871,288 | 840 | 865,700 | -60,449 -62,474 |
| 540 000 542 000 544 000 | 871.415 | 200 | 860 600 | _62 474 _64 381 |
| 544 000 | 871,533 | .329 | 854 500 | -66 176 |
| 544.560 | 871,642 | .071 | 847 400 | 67 864 |
| ,J0U | 871,671 | 0.000 | 854 500 847 400 845 260 | -68 320 |
| | | - | • | 200,000 |

| | TABLE 21. | TRAJECTOR | Y T3N.40 (95) | |
|--|---------------------|-------------------------|----------------------|------------------|
| TIME | RANGE | | (50) | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | USI DATTY | PATH |
| (SEC) | (NMT) | (NMI) | VELOCITY | ANGLE |
| 0.000 | 0.000 | 0.000 | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | .004 | 0.000 35.000 | 90.000 |
| 4.000 | 0,000 | .024 | 35,900 | 90.000 |
| 6.0nn | 0.000 | .061 | 85,000 | 90,000 |
| 8,000 | 0.000 | .114 | 135,800 | 90,000 90,000 |
| 8 000 10 000 12 000 14 000 | 005 | 185 | 188 300 243 000 | 90 000 84 128 |
| 12,000 | 015 | 273 | 299 800 | 82,554 |
| 14.000 | .031 | 380 | 358 900 | 80 949 |
| 16.000 18.000 20.000 | .053 | 507 | 429.400 | 79 329 |
| 10,000 | .082 | 653 | 484 000 | 77,706 |
| | .121 | 818 | 484 000 550 600 | 76,091 |
| 22.000 | .170 | 1,004 | 619 300 | 74 494 |
| 26 000 | .230 | 1,211 | ልባነ በሰል | 72,914 |
| 28 000 | .304 | 1,439 | 765,500 | 71 363 |
| 30 000 | .392 | 1,689 | 843,300 | 69 843 |
| 32 000 | 496 | 1,961 | 424 BAA | 68 357 |
| 34 000 | .617 .756 | 2.254 | 1005,600 | 66 904 |
| 24.000 26.000 28.000 30.000 32.000 34.000 36.000 38.000 | 914 | 2,569 | 1005 600 1089 200 | 65,488 |
| 38.000 | 1.093 | 2,907 3 . 265 | 11/9 200 | 04 100 |
| 40-000 | 1 • 295 | | 1262:100 | 62.758 |
| 42.000 | 1.519 | 3.645 | 1352-400 | 61 • 4 4 4 |
| 44.000 | 1.768 | 4•047 4•472 | 1447-100 | 60 • 1 6 6 |
| 46•000 | 2.044 | 4.918 | 1544.900 | 58.922 |
| 48.000 | 2.347 | 5.388 | 1647-300 | 57.717 |
| 50•000 | 2.680 | 5.882 | 1754.500 1866.800 | 56.548 |
| 52.000 | 3.044 | 6.400 | 1984.500 | 55.418 |
| 54.000 | 3 • 4 4 1 | 6.944 | 2108.300 | 54 • 325 |
| 56.000 | 3.873 | 7,513 | 2238.400 | 53°272 52°135 |
| 58.000 | 4.344 | 8.107 | 2375-100 | 50.655 |
| 60.000 | 4.859 | 8.725 | 2518.400 | 49.380 |
| 62•000 64•000 | 5.422 | 9.355 | 2668.800 | 47.847 |
| 66.000 | 6.036 | 10.027 | 2826.300 | 46.247 |
| 68.000 | 6.706 | 10.708 | 2991.200 | 44.598 |
| 70.000 | 7•434 8•226 | 11-409 | 3163.700 | 42.912 |
| 72.000 | 9.085 | 12.126 | 3343.900 | 41.194 |
| 74.000 | 10.015 | 12.858 | 3531.900 | 39.447 |
| 76.000 | 11.050 | 13.602 | 3727.900 | 37.672 |
| 78.000 | 12-104 | 14•357 15•118 | 3931.900 | 35.866 |
| 80.000 | 13.270 | 15.882 | 4143.900 | 34.027 |
| 82.000 | 14.524 | 16.645 | 4364.000 | 32.148 |
| 84.000 | 15+868 | 17.402 | 4592.000 4827.800 | 30 • 225 |
| | 4 - - | 1406 | 7021.000 | 28.249 |
| | | | | |

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|-------------------------------|--|---------------------------|---|----------------------------------|
| TIME | DANAS | TABLE 21. (| CONT 'D) | |
| FROM | RANGE FROM | | | |
| LAUNCH | LAUNCH | AL TITUDE | 14 5 1 6 6 7 7 1 1 | PATH |
| (SEC) | (NMI) | ALTITUDE (NMI) | VELOCITY | ANGLE |
| 86.000 | 17.307 | 18.147 | (FT/SEC) | (DEG) |
| 88,000 | 18,844 | 18,874 | 5321 200 | 26.210 |
| 90.000 | 20.484 | 19.575 | 5071.000 5321.200 5578.000 | 24.098 21.910 |
| 92.000 | 22.227 | 20.241 | 5841.300 | 19.647 |
| 94.000 | 24.078 | 20.865 | 6111-200 | 17.312 |
| 96.000 98.000 | 26.039 | 21.440 | 6407.500 | 15-231 |
| 100.000 | 28•117 30•317 | 21.979 | 6744.300 | 13.734 |
| 102.000 | 32.642 | 22.500 | 7111.700 | 12,832 |
| 104.000 | 35.098 | 23•024 23•557 | 7500.500 | 12.360 |
| 106.000 | 37.690 | 24.096 | 7908.100 9338.600 | 11.939 |
| 108.000 | 40-426 | 24 • 652 | 8789.300 | 11.559 |
| 110.000 | 43.309 | 25.224 | 9264.900 | 11•235 10•89 ₀ |
| 112.000 114.000 | 46.353 | 25.805 | 9768.100 | 10.563 |
| 116.000 | 49.662 | 26.402 | 10301• ⁹ 00 | 10.261 |
| 118.000 | 53. ₀ 65 56.659 | 27:014 | 10870.200 | 9.980 |
| 120.000 | 60.458 | 27 <u>.</u> 643 28.290 | 11477.500 | 9.720 |
| 122-000 | 64.476 | 28.959 | 12129.100 | 9.480 |
| 124.000 | 68.732 | 29.650 | 12832•000 13594•300 | 9.260 |
| BURN-OUT | OF STAGE | 1 AT | 130-40000 | 9.059 |
| 125.400 | 71 0.5 | _ | 1 | 1 |
| 1234400 | 71.845 | 30.147 | 13902.900 | 8.930 |
| | | | | |
| 126.000 | 73.189 | 30.360 | 13897,200 | |
| 128,000 130,000 | 77,667 | 31,058 | 13878 340 | 8,875 |
| 130,000 | 82,140 | 31,741 | 13860 900 | 8,691 8,508 |
| 132,000 | 86,609 | 32,408 | 13844 900 | 8,324 |
| 134.000 | 91.075 | 33,060 | 13830,000 | 8 139 |
| 136,000 138,000 | 95,536 | 33,697 | 13816,200 | 7,954 |
| 138.000 140.000 142.000 | 99 995 | 34,319 | 13878 300 13860 900 13844 900 13830 000 13816 200 13803 100 13790 900 | 7 769 |
| 142,000 | 104 451 108 904 | 34,925 35,517 | 13790,900 | 7,584 |
| 144.000 | 113 355 | 36 093 | 13779 300 13768 400 | 7.398 |
| 146,000 | 117,803 | 36 655 | 13758 000 | 7,212 |
| 148,000 150,000 | 122,249 | 36,655 37,201 | 13748 100 | 7 026 |
| 150,000 | 126,694 | 37,733 | 13738 700 | 6.652 |
| 152.000 154.000 | 113 355 117 803 122 249 126 694 131 136 135 576 | 38,249 | 13729 800 | 6 839 6 652 6 465 |
| 156,000 | 140 015 | 38,750 | 13721 300 | 6,278 |
| 120 000 | 144 452 | 39.237 39.768 | 13713 100 13705 400 | £ 001 |
| 100.00 | 148 887 | 39,708 40,165 | 13705 400 | 5,903 |
| 105 000 | 153 321 | 40,606 | 13690 800 | 5,/15 5,627 |
| 164,000 | 140,015 144,452 148,887 153,321 157,753 | 41,033 | 13684 000 | 5.903 5.715 5.527 5.339 |
| | | - | • . • • | - , . , |

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TABLE 21. (CONT'D)

| TIME | RANGE | • | | |
|-------------------------------|--------------------|------------------|------------------------|--------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TYTUSE | | PATH |
| (SEC) | (NMI) | ALTITUDE | VELOCITY | ANGLE |
| 166.000 | 162.165 | (NMI) | (FT/SEC) | (DEG) |
| 168.000 | 166,615 | \$1.8\$1 | 13677-500 | 5.151 |
| 170 000 172 000 | 171 043 | 11-041 | 13671.300 | 4,962 |
| 172,000 | 175°471 | 42 223 42 590 | 13665 400 | 4 774 |
| 1/4 000 | 175 471 179 898 | 42,370 | 13659 706 | 4 585 |
| 1/2.000 | 184.323 | 42,942 43,279 | 13654 300 | 4 396 |
| 178-000 | 188.748 | | 13649,169 | 4.207 |
| 180.000 | 193-171 | 43.601 | 13544-200 | 4.018 |
| 182.000 | 197.594 | 43.908 | 13639-562 | 3.829 |
| 184.000 | 202-016 | 44.201 | 13635-200 | 3.639 |
| 186•ànn | 206.437 | 44+478 | 13630.994 | 3•449 |
| 188.000 | 210-857 | 44•740 44•988 | 13627-000 | 3•260 |
| 190.000 | 215.277 | 45.221 | 13523.287 | 3.070 |
| 192.0nn | 219.696 | 45.439 | 13619.800 | 2.883 |
| 194.000 | 224.115 | 45.642 | 13616.556 | 2.690 |
| 196•nnn | 228.533 | 45.830 | 13613.500 | 2,500 |
| 198.000 | 232.950 | 46.003 | 13610.681 | 2.310 |
| 200-000 | 237•367 | 46•161 | 13608-100 | 5.150 |
| 202.000 | 241.783 | ¢ó•304 | 13605.706 | 1.930 |
| 204.000 | 246 • 199 | 46•433 | 13603.500 13601.531 | 1.740 |
| 506-000 | 250.615 | 46.547 | 13599.800 | 1.549 |
| 208.000 | 255.030 | 46.645 | 13598.237 | 1.359 |
| 510.000 | 259 • 446 | 46.729 | 13596.900 | 1.168 |
| 212.000 | 263.860 | 46.798 | 13595.806 | •978 |
| 214.900 | 268 • 275 | 46.852 | 13594.900 | .787 |
| 216.000 | 272.690 | 46.891 | 13594.250 | •597 |
| 218-000 | 277-104 | 46.916 | 13593.800 | •407 |
| 550.000 | 281.518 | 46.926 | 13593.550 | •216 |
| 255.000 | 285.933 | 46.920 | 13593.500 | •025 •165 |
| 224.000 | 290 • 347 | 46.900 | 13593.650 | 356 |
| 226.000 | 294.760 | 46 • 866 | 13593.900 | 546 |
| 230 000 | 299,175 | 46.814 | 13594,531 | 737 |
| 230,000 232,000 234,600 | 303,590 | 46,749 | 13595 300 | - 927 |
| 234 600 | 308 004 | 46,669 | 13596 256 | -1,118 |
| 236.000 | 312,419 | 46,575 | 13596 256 13597 400 | -1 308 |
| 238.000 | 316.834 | 46.465 | 13549,014 | -1.498 |
| 240.000 | 321.249 | 46,341 | 13600.400 | -1.689 |
| 242.000 | 325 • 664 | 46.505 | 13602.175 | -1.679 |
| 244.000 | 330 • 081 | 46.047 | 13604.200 | -2.069 |
| 246.000 | 334 • 497 | 45.878 | 13606,375 | -2.259 |
| 248.000 | 338•913 343•330 | 45.694 | 13608.700 | -2.450 |
| 250.000 | 347 • 748 | 45•495 | 13611.294 | -2.640 |
| | 3414140 | 45+281 | 13614.100 | -2.830 |
| | | | | • |

TABLE 21. CONT'D)

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| TIME | RANGE | | | |
|--------------------|-----------------------|----------------------------|----------------------------|--------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 252.000 | 352.166 | 45.052 | 13617.069 | -3.020 |
| 254.000 | 356,584 | 44.809 | 13620,200 | -3.210 |
| 256,000 258 | 361,003 | 44,551 | 13623 581 | -3,400 |
| 258 000 360 000 | 365,422 | 44.277 | 13623 581 13627 100 | -3,589 |
| 260,000 | 369,842 | 43,989 | 13630 787 | -3,779 |
| 262,000 | 374 263 | 43 686 43 368 43 035 | IZAZA /NN | -3 968 |
| 264 000 | 378 684 | 43,368 | 13638 756 13642 900 | -4.158 |
| 266 000 268 000 | 383 107 387 530 | 43,035 | 13642,900 | -4 347 |
| 268 000 270 000 | 301 053 | 42 687 42 324 | 13647 338 13651 900 | -4 536 |
| 272.000 | 391 953 396 378 | 42,324 | 13651 900 | -4,726 |
| 274.000 | | 41,946 | 12020*290 | _4.915 |
| 276.000 | 400 c ² 03 | 41.554 | 13661.400 | -5.103 |
| 278 • 000 | 405·229 409·656 | 41-147 | 13666.375 | -5.292 |
| 280.000 | 414.084 | 40.724 | 13671-400 | -5•48] |
| 282.000 | 418.512 | 40.287 | 13676.650 | ~ 5•669 |
| 284.000 | 422.941 | 39•835 39•368 | 13681.900 | ~5•858 |
| 286.000 | 427.371 | 38.886 | 13687.325 | -6.046 |
| 288.000 | 431.802 | 38•389 | 13692.700 | -6.234 |
| 290.000 | 436.233 | 37.877 | 13698.200 13703.600 | -6.422 |
| 292.000 | 440.665 | 37.350 | 13703.000 | -6.610 |
| 294 • 000 | 445.098 | 36.809 | 13714-400 | -6.798 |
| 296.000 | 449.532 | 36.252 | 13719.844 | -6.985 -7.173 |
| 298.000 | 453.966 | 35 • 681 | 13724.900 | -7.360 |
| 300.000 | 458.401 | 35.095 | 13730 • 062 | -7.547 |
| 302.000 | 462.836 | 34.494 | 13734.600 | -7.734 |
| 304.000 | 467.272 | 33,878 | 13739.287 | -7.921 |
| 306.000 | 471.707 | 33•248 | 13743.000 | -8.107 |
| 308.000 | 476.143 | 32.605 | 13746.862 | -8.294 |
| 310.000 | 480.578 | 31.942 | 13749.300 | -8.481 |
| 312•000 314•000 | 485.013 | 31 • 267 | 13751.769 | -8.668 |
| | 489.447 | 30.578 | 13752.300 | -8.854 |
| 316•000 318•000 | 493-881 | 29.875 | 13752.700 | -9.039 |
| 320.000 | 498.310 502.739 | 29.156 | 13750 • 400 | -9.227 |
| 322.000 | 507.165 | 28•423 27•675 | 13746.900 | -9.413 |
| 324.000 | 511.587 | 26.914 | 13741-200 | -9.600 |
| 326.000 | 516.004 | 26 • 139 | 13732.800 | -9. /87 |
| 328.000 | 520.416 | 25•35 ₀ | 13720 • 900 13704 • 900 | -9.974 |
| 330.000 | 524.820 | 24.547 | 13683.300 | ~10 • 161 |
| 332.000 | 529.214 | 23.732 | 13654.700 | *10·349 |
| 334•000 | 533.596 | 22.903 | 13617.100 | -10:538 |
| 336.000 | 537.962 | 22.063 | 13568.100 | -10•727 -10•917 |
| | • • • | :0 | -300-1100 | TOASTI |

TABLE 21. (CONT'D)

| TIME | PANCE | | | |
|-------------------------------|-------------------------------|------------------|------------------------|---------------------|
| FROM | RANGE | | | |
| LAUNCH | FROM | | | DATU |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | PATH |
| 338.000 | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 340 000 | 542.309 | 21.212 | 13504.700 | (DEG) |
| 340.000 | 546,630 | 20,351 | 13422.700 | -11.109 |
| 342.000 | 550,920 555,170 | 19,481 | 13317 200 | -11.302 |
| 344.000 | 555,170 | 18,604 | 13181 600 | -11,498 |
| 346 000 348 000 | 75Y 368 | 18,604 17,722 | 13101 000 | -11,697 |
| 340,000 | 202 201 | 16 839 | 13008 100 12787 100 | -11 200 |
| 720,000 | 567,553 | 15,958 | 12/0/ 100 12848*7** | -12 108 |
| 325,000 | 567 553 571 502 | 15,083 | 12508 700 | -12,323 |
| 354 000 356 000 | 575 328 579 006 582 510 | 14,220 | 12165 900 | -12,546 |
| 356,000 | 579,006 | 13-274 | 11750 200 | _12 780 |
| 358,000 | 582 510 | 13,374 | 11254 900 | -13, 329 |
| 360 000 | 585 814 | 12,552 | 10677 800 | -13 296 |
| 360 000 362 000 | SEA EDE | 11,760 | 10023 200 | _13_585 |
| J04 DAA | 591 733 | 11,004 | 9301,400 | _13 901 |
| 366 000 | 594 314 | 10,291 | 8523 200 | 14 253 |
| 368 000 | 596 425 | 9,624 | 7716 600 | 14 648 |
| 366 000 368 000 370 000 | 596 635 598 699 600 521 | 9.006 | 6911~400 | 15 094 |
| 372,000 | 600 521 | 0,437 | 6135 700 | 15 603 |
| 374.000 | 603.110 | 7,919 | 5411 100 | 16 185 |
| 376-000 | 602.119 | 7.445 | 4747.600 | 16.853 |
| 378-000 | 603.512 | 7.012 | 4148.100 | -17.621 |
| 380.000 | 604 • 723 | 6.617 | 3615.800 | 110021 |
| 382.000 | 605.773 | 6+255 | 3152.000 | 18.503 |
| 384.000 | 606.682 | 5.922 | 2750.900 | *19.515 |
| 384.000 | 607.470 | 5.614 | 2404.400 | -20.67 2 |
| 386.000 | 608 • 153 | 5.328 | 2108.900 | -21.99 ₁ |
| 388.000 | 608.746 | 5.060 | 1856.900 | -23.487 |
| 429.993 | 613.440 | 0.000 | 10200.00 | -25.171 |
| | • • • | טְטעיִט | 853.230 | -71.492 |

TABLE 22. TRAJECTORY T3N.40 (100)

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| TIME | RANGE | | • | |
|------------------|----------------|------------------|--|------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | •004 | 35,900 | 90,000 |
| 4,000 | 0_000 | _024 | 85 000 | 90 000 |
| 6 000 | 0,000 | 061 | 135 800 | 90,000 |
| 8,000 | 0.000 | 114 | 188 300 | 90,000 |
| 10 000 | 005 | 185 | 243 [°] 000 299 [°] 800 | 84 128 |
| 12,000 | .015 | 273 | 299,800 | 82,554 |
| 14,000 | .031 | .380 | 358,900 | 80,949 |
| 16,000 18,000 | .053 | 507 | 420,400 | 79 329 |
| 20.000 | .082 .121 | 653 | 484 900 | 77,706 |
| 22.000 | | .818 | 550.600 | 76.091 |
| 24.000 | •170 | 1.004 | 619.300 | 74.494 |
| 26.000 | •230 •304 | 1•211 1•439 | 691.000 | 72.914 |
| 28.000 | •392 | 1.689 | 765.600 843.300 | 71.363 |
| 30.000 | •496 | 1.961 | 924.000 | 69,843 68,357 |
| 32.000 | •617 | 2.254 | 1005.600 | 66.904 |
| 34-000 | .756 | 2.569 | 1089.200 | 65.488 |
| 36.000 | .914 | 2.907 | 1174.500 | 64.106 |
| 38.000 | 1 • 0 9 3 | 3.265 | 1262-100 | 62.758 |
| 40.000 | 1 • 295 | 3.645 | 1352.400 | 61.444 |
| 42.000 | 1.519 | 4.047 | 1447.100 | 60.166 |
| 44.000 | 1.768 | 4.472 | 1544.900 | 58.922 |
| 46.000 | 2.044 | 4.918 | 1647.300 | 57.717 |
| 48.000 | 2.347 | 5.388 | 1754.500 | 56.548 |
| 50.000 | 2.680 | 5.882 | 1866.800 | 55.418 |
| 52.000 | 3.044 | 6.400 | 1984.500 | 54 • 325 |
| 54.000 | 3.441 | 6.944 | 2108.300 | 53.272 |
| 56.000 58.000 | 3.873 | 7.513 | 2238.400 | 52 • 135 |
| 60.000 | 4.344 4.859 | 8 • 107 | 2375.100 | 50.822 |
| 62.000 | 5.422 | 8.725 | 2518.400 | 49.380 |
| 64.000 | 6.036 | 9.365 | 2668.800 | 47.847 |
| 66.000 | 6.706 | 10•027 10•708 | 2826.300 2991.200 | 46.247 44.598 |
| 68.000 | 7.434 | 11.409 | 3163.700 | 42.912 |
| 70.000 | 8.226 | 12.126 | 3343.900 | 41.194 |
| 72.000 | 9.085 | 12.858 | 3531.900 | 39,447 |
| 74-000 | 10.015 | 13.602 | 3727.900 | 37.672 |
| 76.000 | 11.020 | 14.357 | 3931.900 | 35.866 |
| 78.000 | 12.104 | 15.118 | 4143.900 | 34.027 |
| 80.000 | 13.270 | 15,882 | 4364.000 | 32.148 |
| 82.000 | 14.524 | 16.645 | 4592.000 | 30 • 225 |
| 84.000 | 15.868 | 17.402 | 4827.800 | 28.249 |
| | | | | |

TABLE 22. (CONTIN)

| TIME | RANGE | | | |
|------------------|--------------------|--------------------------------------|---------------------------|------------------|
| FROM | FROM | | | |
| LAUNCH | L/-JNCH | ALTITUDE | VEL DELTY | PATH |
| (SEC) | (NMT) | (NMI) | VELOCITY | ANGLE |
| 86.000 | 17.307 | 18.147 | (FT/SEC) | (DE6) |
| 88,000 | 18,844 | 18,874 | 5071.000 | 26.210 |
| 90,000 | 20 484 | 10 675 | 5321,200 5578,000 | 24,098 |
| 92,000 | 22,227 | 19,575 20,241 | 5841 300 | 21,910 |
| 94,000 | 24 078 | 20 865 | a - | 15 647 |
| 94 000 96 000 | 26 038 | 20 865 21 435 21 944 22 38; | 6111 200 6388 200 | 17,312 |
| 98 000 | 28, 109 30, 292 | 21 944 | 6674 100 | 14°914 12°465 |
| 100,000 | 30, 292 | 22 381 | 6977 100 | 12,405 |
| 102.000 | 32.596 | 22,757 | 7341.500 | 10.078 |
| 104-000 | 35.032 | 23.094 | | 8.415 |
| 106-000 | 37-607 | 23.415 | 7744.700 | 7.325 |
| 108-000 | 40+328 | 23•732 | 8177-200 | 6•788 |
| 110-000 | 43.201 | 24 • 045 | 8632-600 | 6-403 |
| 112.000 | 46.239 | 24 • 332 | 9114.500 | F.825 |
| 114-000 | 49.441 | 24.660 | 9622.500 | 5.589 |
| 116.000 | 52.939 | 24.959 | 10160•200 10732•100 | 5.295 |
| 118.000 | 56.531 | 25.267 | 11342-400 | 4.997 |
| 120.000 | 60.331 | 25•576 | 11996.700 | 4.728 |
| 122.000 | 64.352 | 25.885 | 12701.500 | 4.482 |
| 124.000 | 68.613 | 26.197 | 13465.000 | 4.255 |
| BURN-OUT | OF STAGE | 1 AT | 20 100 0 00 | 4.049 |
| 125.400 | 71.731 | 26.415 | 13773.900 | 3.915 |
| 126.000 | 73.078 | 24 - 22 | | |
| 128.000 | 77.560 | 26.507 | 13766.200 | 3.859 |
| 130,000 | 82.035 | 26.805 | 13739.900 | 3.670 |
| 132.000 | 86.502 | 27.086 | 13715.300 | 3.480 |
| 134.000 | 90.963 | 27.353 | 13692.200 | 3•290 |
| 136.000 | 95.417 | 27.604 | 13670.500 | 3.100 |
| 138.000 | 99.866 | 27.839 | 13650 - 100 | 2,909 |
| 140.000 | 104.308 | 28.060 | 13630.700 | 2.717 |
| 142.000 | 108.745 | 28 • 265 28 • 455 | 13612.400 | 2•525 |
| 144.000 | 113.177 | 28.629 | 13595.000 | 2.332 |
| 146.000 | 117.605 | 28.788 | 13578.400 | 2.139 |
| 148.000 | 122.027 | 28.932 | 13562.500 | 1.946 |
| 150.000 | 126.445 | 29.061 | 13547.400 | 1.752 |
| 152.000 | 130.858 | 29•175 | 13532.800 | 1.558 |
| 154.000 | 135.267 | 29.273 | 13518.800 | 1.364 |
| 156.000 | 139.672 | 29•273 29•356 | 13505.400 | 1.169 |
| 158.000 | 144.073 | 29.424 | 13492-400 | •973 |
| 160.000 | 148.470 | 29•476 | 13479.800 | •778 |
| 162.000 | 152 • 863 | 29.514 | 13467.600 | •582 |
| 164.000 | 157.253 | 29·536 | 13455-800 | •386 |
| + 5 U | ; - 2.00 | 674230 | 13444.300 | •190 |

TABLE 22. (CONT'D)

| TIME | RANGE | | | |
|--------------------|--|--|-------------------------------------|--------------------|
| FROM Launch | FROM | A1 77705 | | PATH |
| (SEC) | LAUKCH | ALTITUDE | VELOCITY | ANGLE |
| 166-000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 168,000 | 161.639 | 29.543 | 13433.000 | 007 |
| 170,000 | 166.021 | 29,535 | 13422,000 | -,204 |
| 172,000 | 170 399 174 774 | 29,512 | 13411 200 | 402 |
| 174,000 | 179 146 | 29,413 | 13450,600 | - 599 |
| 176,000 | 183 514 | 27,417 | 13390 000 | -,797 |
| 178,000 | 187.878 | 29.512 29.473 29.419 29.350 29.266 29.167 | 13379 600 | 995 |
| 180,000 | 192,239 | 29,200 | 13369 200 | -1,193 |
| 182,000 | 196 596 | 54,101 | 13358 800 | -1,392 |
| 184,000 | 196 596 200 949 | 29,053 28,923 | 13348 300 | -1,591 |
| 186.000 | 205.299 | 28.778 | 13337 800 13327 200 | -1,790 |
| 188-000 | 209.645 | 28,619 | | 1.990 |
| 190.000 | 213.987 | 28•444 | 13316.300 | -2.189 |
| 192.000 | 218-325 | 28•253 | 13305 • 300 | ~2.389 |
| 194.000 | 222,658 | 28.048 | 13293.900 13282.100 | -2.590 -2.790 |
| 196,000 | 226 988 | 27,828 | 13269 900 | -2,790 2 491 |
| 198,000 | 226,988 231,312 235,632 | 27,828 27,592 27,342 | 13257 100 | -2,991 -3,192 |
| 200.000 | 235,632 | 27.342 | 13243 600 | -3 394 |
| 202,000 | 239,947 | 27.076 | 13229 400 | -3.596 |
| 204,000 | 239,947 244,256 | 26 796 | 13214,300 | -3,798 |
| 206,000 | 248 560 252 857 257 148 261 432 | 26,500 26,189 25,864 25,524 25,168 | 13198 100 | -4.001 |
| 208,000 | 252,857 | 26,189 | 13180 800 | -4.204 |
| 210,000 | 257,148 | 25,864 | 13162,100 | ~4.407 |
| 212,000 | 261,432 | 25,524 | 13141,800 | -4,611 |
| 214.000 | 265,708 | 25,168 | 13119,/00 | -4,816 |
| 216,000 | 269,975 | 24.798 | 13095_300 | -5,021 |
| 218,000 | 274 234 | 24,414 | 13068 300 | -5,227 |
| 220.000 | 278,482 | 24.015 | 13038,300 | -5,434 |
| 222.000 224.000 | 282,719 | 23,601 | 13004,900 | -5,641 |
| 226,000 | 286,944 | 23,173 | 12967.300 | -5,850 |
| 228,000 | 291,154 295,349 | 22,731 | 12925,100 | -6.059 |
| 230,000 | 299 526 | 22,275 | 12877.400 | -6.270 |
| 232,000 | 303 683 | 21,805 21,322 | 12823 300 | -6.482 |
| 234,000 | 307.817 | 50.856 | 12/01 700 | _6 695 |
| 236.000 | 311.926 | 20.317 | 12761 700 12691 500 12611 200 | -6.911 -7.128 |
| 238.000 | 316.006 | 19.796 | 12518.900 | -7.348 |
| 240.000 | 320 • 052 | 19.263 | 12412.900 | -7.57 ₁ |
| 242.000 | 324.059 | 18.720 | 12290.700 | -7.796 |
| 244.000 | 328.023 | 18•166 | 12149.800 | -8.026 |
| 246•000 | 331 - 936 | 17.603 | 11987.200 | -8.260 |
| 248.000 | 335.790 | 17.033 | 11797.800 | -8.500 |
| 250.000 | 339.576 | 16.456 | 11581.200 | -8.745 |
| | | - ' | | |

TABLE 22. (CONT'D)

| TIME | RANGE | • | • | |
|--|-------------------------------|--------------------------------------|--|--|
| FROM | | | | |
| LAUNCH | FROM | 41 202 | | PATH |
| | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 252.000 | 343.286 | ¹ 5•874 | 11334.700 | *8+999 |
| 254,000 | 346,909 | 15,289 | 11055,700 | -9,261 |
| 256,000 | 350,434 | 14,704 14,119 | 10741 800 | -9,533 |
| 258 000 | 353 849 | 14,119 | 10391 300 | 9 817 |
| 260 000 | 357 143 | 12,638 | 10003 500 | 10,115 |
| 565,000 | 360 303 | 12 963 12 397 | 9578 900 | 10,430 |
| 264 000 | 363 317 366 174 368 862 | 12,397 | 9116 000 | _10_765 |
| 200,000 | 366 3174 | 11 843 11 304 10 781 10 278 | 8618 200 | -11,123 |
| 200_000 | 368 862 | 11.304 | 8091 300 | -11,508 |
| 2/0_000 | 3/1,374 | 10,781 | 7543 600 | -11.925 |
| 212,000 | 373,704 | 10.278 | 6985 800 | -12,380 |
| 274,000 | 375,853 | 9.796 | 6429 600 | 12 879 |
| 2/8,000 | 377 820 | 9,796 9,335 | 5885 000 | _12_878 _13_425 |
| 2/0,000 | 379,613 | 8,896 | 5360 300 | 12,453 |
| 280,000 | 381,238 | 8,480 | 4860 900 | -14 030 -14 699 |
| 282 AAA | 382_704 | 8.784 | 4390 200 | _15_441 |
| 284 000 | 384 020 | 7.710 | 3950 600 | 16 267 |
| 286,000 | 385 199 | 7:355 | 4390°200 3950°600 3546°700 | _16 267 _17 187 |
| 288,000 | 386 250 | 7:355 7:019 | 3180 100 | 18 212 |
| 290,000 | 387 187 | 6 701 | 3180 100 2849 500 | 18 212 19 352 |
| 284 000 286 000 288 000 290 000 292 000 294 000 296 000 298 000 | 388 020 | 6 397 | 2550°700 | 50,619 |
| 294,000 | 388,759 | A 100 | 2282,000 | |
| 296 000 | 389 413 | 5 834 | 2042.000 | _22 025 _23 584 |
| 298 000 | 389,992 | 5,571 | 1831,200 | -25 304 |
| 444.000 | 390 5n4 | 5 318 | 1650 900 | -25,306 |
| JUZ 000 | 390 960 | 5.073 | 1495 300 | _27 195 |
| 304 000 306 000 | 390 960 391 364 | 4 836 | 1360 900 | 29 250 |
| 306 000 | 391 725 | 4 605 | 1246 500 | 31,469 |
| 308,000 | 392 047 | 4 379 | 1149 300 | 33 841 |
| 308 000 310 000 312 000 | 392 335 | 4 156 | 1072 300 | -30 331 |
| 312,000 | 392,597 | 3,934 | 1018 100 | -38,973 |
| 314 400 | 392,837 | 3,710 | 979 900 | .38 973 .41 656 |
| 310 000 | 393,059 | 3.483 | 952 700 | -77.370 |
| 318,000 | 393,265 | 3,251 | 732 700 | |
| 320,000 | 393,457 | 3,015 | 933 300 919 200 908 900 | -49.599 -52.105 |
| 322,000 | 393,636 | 2,774 | 217 EUU | -52,105 |
| 324,000 | 393.804 | 2 528 | 901,200 | |
| 326,000 | 393,961 | 2,528 | 401,200 | -50,800 |
| 328,000 | 394,108 | 2,277 | 895 300 890 600 | -58,975 |
| 330.000 | 394,245 | 2.023 1.764 | 994 70A | -61.034 |
| 332,000 | 394,373 | 1 502 | 000,100 | -02,976 |
| 334,000 | 394,493 | 1.503 | 886.700 883.300 880.200 877.200 | -56.800 -58.975 -61.034 -62.976 -64.805 -66.524 |
| 336,000 | AAA AAS | 1,238 | 001.200 | -00,524 |
| 338.000 | 394,604 | 972 | 811.500 | 1 00,100 |
| 340 046 | 394.708 | • 703 | 87J.800 | -69.651 |
| 340.000 | 394.804 | .433 | 868.700 862.000 857.400 | -71.070 |
| 342 000 | 394 894 | ,162 | 862,000 | _72_403 |
| 343 200 | 394 945 | 0,000 | 857 400 | _73 165 |

| TIME | RANGE | | | |
|------------------------------------|--------------|------------|--------------------|--------------------------------------|
| FROM | FROM | | | 845.4 |
| LAUNCH | LAUNCH | ALTITUDE | UEI ORTTV | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 0.000 | 0.000 | 0.000 | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | •004 | 0.000 35.000 | 90.000 |
| 4.000 | 0.000 | .024 | 35.900 | 90.000 |
| 6,000 | 0.000 | 061 | 85,000 135,800 | 90.000 |
| 8,000 | 0.000 | .114 | 188 300 | 90,000 |
| 6 000 8 000 10 000 12 000 | 005 | 185 | 243 000 | 90 000 84 128 82 554 80 949 |
| 12,000 | 015 | 273 | 299 800 | 84,128 |
| 14,000 | .031 | 380 | 358 900 | 82,554 |
| 16,000 | 053 | . 507 | 350,700 | 80 949 |
| 18.000 | :082 | 507 653 | 420°400 484°000 | 79 329 |
| 20.000 | •121 | | 484.000 | 77.706 |
| 22.000 | •170 | -818 | 550.600 | 76.091 |
| 24.000 | 41/0 | 1.004 | 619.300 | 74.494 |
| 26.000 | •230 | 1.511 | 691.000 | 72.914 |
| 28.000 | •304 •392 | 1.439 | 765.600 | 71.363 |
| 30.000 | •496 | 1.4.7 | 843.300 | 69.843 |
| 32.000 | •617 | 1.961 | 924 • 000 | 68.357 |
| 34.000 | •756 | 2.254 | 1005.600 | 66.904 |
| 36.000 | .914 | 2.569 | 1089-200 | 65•488 |
| 38.000 | 1.093 | 2.907 | 1174.500 | 64.106 |
| 40.000 | 1.295 | 3.265 | 1262-100 | 62.758 |
| 42.000 | 1.519 | 3.645 | 1352.400 | 61.444 |
| 44.000 | 1.768 | 4.047 | 1447.100 | 60.166 |
| 46.000 | 2.044 | 4.472 | 1544.900 | 58,922 |
| 48.000 | 2.347 | 4.918 | 1647.300 | 57.717 |
| 50.000 | 2.680 | 5,388 | 1754.500 | 56,548 |
| 52.000 | 3.044 | 5.882 | 1866.800 | 55,418 |
| 54.000 | 3.441 | 6.400 | 1984.500 | 54.325 |
| 56.000 | 3.873 | 6.944 | 2108.300 | 53.272 |
| 58.000 | 4.344 | 7.513 | 2238.400 | 52 • 135 |
| 60.000 | 4.859 | A • 107 | 2375.100 | 50.855 |
| 62.000 | 5•422 | 8 • 725 | 2518 • 400 | 49.380 |
| 64.000 | 6.036 | 9.365 | 2668.800 | 47.847 |
| 66 • 000 | 6.706 | 10.027 | 2826.300 | 46.247 |
| 68.000 | 7.434 | 10.708 | 2991.200 | 44.598 |
| 70.000 | 8.226 | 11.409 | 3163.700 | 42.912 |
| _ + - 0 0 0 | ~ • 6 2 0 | 12.126 | 3373"8 | 41 104 |

TABLE 23. TRAJECTORY T3N.40 (105)

TELEVISE TELEVISE SANTONIONES CONTRACTORISMONIONES NTRACTORISMONICA CONTRACT

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Transport !

T VOICE OF

12.126

12.858

13.602

14.357

15.118

15.882

16.645

17.402

3343.900

3531.900

3727.900

3931.900

4143.900

4364.000

4592.000

4827.800

8.226

9.085

10.015

11.020

12.104

13.270

14.524

15.868

72.000

74.000

76.000

78.000

80.000

82.000

84.000

41.194

39.447

37.672

35.866

34.027

32.148

30.225

28.249

TABLE 23. (CONT'D)

| | 1.1211 | , 23. (COMI | <i>ע</i> | |
|-------------------------------|--|--|-------------------------------------|--|
| TIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCI: | ALTITUDE | VELOCITY | |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 86.000 | 17.307 | 18-147 | 5071.000 | (DEG) |
| 88.000 | 18.844 | 18.874 | 5321.200 | 26.210 |
| 90,000 | 20,484 | 19,575 | 5578,000 | 24.098 |
| 92,000 | 20.484 22.227 | 20,241 | 5841 300 | 21.910 19.647 17.312 |
| 94.000 | 24,078 | 20,865 | 5042,300 6111 200 | 19,047 |
| 96,000 | 26,038 | 21,435 | 6111 200 | 17,312 |
| 98,030 | 28,109 | 21,944 | 6388,200 6674,100 | 14,914 |
| 100,000 | 30,292 | 22,381 | | 12,465 |
| 102,000 | 30,292 32,589 | | 6970 400 | 7,700 |
| 104 000 | 35 001 | 22,737 | 7280 500 7608 500 | 7.200 |
| 106,000 | 35,001 37,534 | 23,004 | 7000,300 | 5,050 |
| 108 000 | 40 201 | 23,179 23,272 | 7977 200 | 2,862 |
| 110,000 | 43 014 | 23,272 | 8402 100 | 1,195 |
| 112,000 | 45 988 | 23,301 | 8875,600 | 094 |
| 114,000 | 49 134 | 23,290 | 9387 600 | -,427 |
| 116,000 | 52 548 | 23,257 | 9930 500 | - 751 |
| 118,000 | 56.102 | 23,201 | 10508 400 | -1 332 -1 497 |
| 120,000 | 50.202 | 23.085 | 11123 200 | -1,497 |
| 122,000 | 63 867 | 23,006 | 11779 100 | -1,730 |
| 124,000 | 40.201 43.014 45.988 49.134 52.568 56.102 59.844 63.807 68.009 | 22,865 | 12484 100 | -1 730 -1 973 |
| ,000 | 68,009 | 22,711 | 13244 600 | -2 186 |
| BURN-OUT | OF STAGE | 1 AT | · | • |
| 125,400 | 71.085 | 22.589 | 13549.600 | -2.324 |
| | | | | |
| 126.000 | 72.413 | 20.524 | | |
| 128.000 | | 22.534 | 13534.000 | -2.383 |
| 130,000 | 76.825 81,218 | 22.342 | 13476,100 | -2.579 |
| 132.000 | 95 E00 | 22,135 | 13415,600 | -2,776 |
| 134.000 | 85,590 89,940 | 21,914 | 13352,300 | -2,975 |
| 136,000 | 07,740 9Å 247 | 21,679 | 13285,700 | -3,175 |
| 138,000 | 77,201 08 671 | 21,430 | 13215,400 | _3 378 |
| 140.000 | 94.267 98.571 102.848 107.098 111.319 115.508 119.664 | 21,167 | 13140.900 | -3 582 -3 788 -3 997 -4 207 -4 421 |
| 142.000 | 102,040 | 20.890 | 13061 500 | -3 788 |
| 144 000 | 107,098 | 20,599 | 15211 000 | ~ 3_997 |
| 144.000 | 111,319 | 20,294 | 15480 200 | -4.207 |
| 146.000 | 115,508 | 19,976 | 12788 800 | -4.421 |
| 148.000 | 119,664 | 19,645 | 12683 700 | -4 637 |
| 420.000 | 123 783 127 862 131 898 | 19,301 | 12683 700 12569 900 | _4 637 _4 856 |
| 152,000 | 151.865 | 18,945 | 15440 400 | 5 079 |
| 154 000 | 131,898 | 18,576 | 16316 100 | -5.079 -5.305 |
| 130 000 | 135.888 139.826 | 21.167 20.890 20.599 20.294 19.976 19.645 19.301 18.945 18.576 18.196 17.804 17.401 | 12165 600 12005 500 11829 900 | |
| 160 000 | 134 859 | 17,804 | 12005 500 | _5°770 |
| 158 000 160 000 162 000 | 143 709 147 530 | 17,401 | 11829 900 | _6°010 |
| 164 000 | 141.530 | 10,707 | 11636*100 | _5 770 _6 010 _6 256 |
| 164,000 | 151 284 | 16,567 | 11425 100 | 6 508 |
| | | - | • | _ • |

ESTANIA DE PARTICION DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA DE LA COMPANSA D

TABLE 23. (CONT'D)

| TIME | RANGE | | | |
|--|--------------------|----------------------------|--------------------|--|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 166.000 | 154.965 | 16.137 | 11195.600 | (DEG) |
| 168,000 | 158 567 | 15,699 | 10946 300 | *6•767 |
| 170 000 | 162 083 | 15°256 | 10676 000 | .7.035 .7.312 |
| 172,000 | 165 505 | 15 254 14 805 14 351 | 10384 000 | 7 599 |
| 174,000 | 168 827 | 14 251 | 10069 600 | 7 898 |
| 176,000 | 172 041 | 13.894 | 9732 800 | _7`898 |
| 178,000 | 172 041 175 141 | 13 894 13 436 | 9372,000 | 8 210 |
| 180,000 | 178 116 | 12 979 | 8987 300 | -8 537 |
| 182,000 | 180 962 | 12,979 12,523 | 8580 400 | _8 882 244 |
| 184,000 | 183,669 | 12,072 | 8153 800 | -9 246 -9 632 |
| 186,000 | 186,234 | 11,626 | 7711 100 | 10 045 |
| 188,000 | 188,650 | 11,187 | 7256 700 | -10,045 |
| 190,000 | 190,915 | 10.757 | 6795 800 | -10,455 |
| 192,000 | 193.028 | 10.337 | 6335,000 | -10 045 -10 486 -10 961 -11 473 |
| 194,000 | 194,991 | 9.928 | 5880 400 | -11,413 |
| 196,000 | 196 805 | 9 530 | 5436 700 | 12,622 |
| 198,000 | 198,475 | 9,145 | 5007.200 | 12 390 |
| 200,000 | 200,006 | 8,773 | 4595 600 | 14 007 |
| 202,000 | 201,405 | 8,413 | 4202,100 | 14 702 |
| 204 056 | 202,677 | 8.066 | 3830,800 | 15 452 |
| 206 000 208 000 210 000 212 000 214 000 216 000 | 203,830 | 7,732 | 3484 600 | 12.029 12.632 13.289 14.007 14.792 15.653 16.599 |
| 208 000 | 204,873 | 7,411 | 3164 800 | 17 639 |
| 210,000 | 205,814 | 7,101 | 2871 000 | 18,780 |
| 212,000 | 206,661 | 6 802 | 2600 800 | .20 034 .21 \$10 |
| 214,000 | 207,422 | 6,514 | 2353,000 | 21.610 |
| 216,000 | 208,103 | 6 236 | 2127 800 | 22.450 |
| 218 000 220 000 222 000 224 000 226 000 228 000 | 208,712 | 5 969 | 1923 200 | 22 920 24 573 |
| 220,000 | 209 255 | 5.710 | 1742 300 | 26 377 |
| 222,000 | 209.740 | 5,459 | 1585 500 | 28,334 |
| 224 000 | 210,174 | 5,214 | 1447 500 | 28 334 30 442 |
| 226,000 | 210,562 | 4.975 | 1327 700 | 32 696 |
| 228,000 | 210,910 | 4.742 | 1224 500 | .35 085 |
| 230,000 | 211,223 | 4,512 | 1136 100 | 37 593 |
| 232,000 | 211,504 | 4,285 | 1066 200 | -40.193 |
| 234,000 | 211,760 | 4.058 | 1016,400 | -42,837 |
| 236,000 | 211,995 | 3,829 | 980,600 | -45,478 |
| 238,000 | 212,213 | 3,597 | 955 000 | 48 079 |
| 238 000 240 000 242 000 | 212,415 | 3,361 | 936 500 | 50,611 |
| 242,000 | 212,604 | 3,121 | 922 800 | 53 054 |
| 244.000 | 212,781 | 2,876 | 922 800 912 700 | .55 395 |
| 246 000 | 212,946 | 2,626 | 905,000 | -57,627 |
| 248,000 | 213,100 | 2,373 | 899,000 | . 59,745 |
| 250,000 | 213,244 | 2,115 | 894 100 | -61.749 |
| ▼ . | • | | | |

TABLE 23. (CONT'D)

| TIME | RANGE | | | |
|--|---|--|--|--|
| FROM LAUNCH (SEC) 252.000 254.000 256.000 260.000 262.000 264.000 265.770 | FROM LAUNCH (NMI) 213.378 213.504 213.621 213.730 213.832 213.926 214.014 214.086 | ALTITUDE (NMI) 1.854 1.590 1.324 1.055 .784 .513 .240 0.000 | VELOCITY (FT/SEC) 890.000 086.300 883.000 879.700 876.500 872.000 865.800 859.019 | PATH ANGLE (DEG) -63.640 -65.420 -67.094 -68.666 -70.140 -71.522 -72.819 -73.901 |
| | | ≟ | | |

TAPLE 24. TRAJECTORY T3N.40 (110)

| ¥ 5 245 | | | - () | |
|--|-----------------|--|--|--|
| TIME FROM | RANGE | | | |
| LAUNCH | FROM | A 1 = 1 (a = 1 | | PATH |
| (SEC) | LAUNCH (NMI) | ALTYTUDE | VELOCITY | ANGLE |
| 0.000 | 0.000 | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | 0.000 | 0.000 | 90.006 |
| 4.000 | 0,000 | .004 | 35,900 | 90,000 |
| 6,000 | 0.000 | .024 | 85,000 | 90,000 |
| 8,000 | 0,000 | .061 | 135 800 | 90,000 |
| 10,000 | 2005 | ,114 | 188 300 | 90.000 |
| 14,000 | .015 | 185 | 243 000 | 84 128 |
| 14.000 | .031 | 273 | 299.800 | 82,554 |
| 10,000 | 053 | 380 507 | 358 900 | 80,949 |
| 19 000 | .082 | 653 | 420 400 | 79 329 |
| ~v_000 | .121 | 818 | 484 000 550 600 | 77,706 |
| 22 <u>.</u> 000 . | 170 | 1 004 | 619,300 | 76 091 |
| <- <u>_</u> 000 | 230 | 1,211 | 691,000 | 74_494 |
| 26,000 | 304 | 1,439 | 765,600 | 72 914 |
| 28 000 | 392 | 1 689 | 843 300 | 71 363 |
| 30,000 | 496 | 1,961 | 924.000 | 97 RYS |
| 34.000 | 617 | 2 254 | 1005 600 | 68 357 |
| 34,000 | 756 | 2,569 | 1089 200 | 66 904 |
| 38,000 | .914 | 2,907 | 1174 500 | 65 488 |
| 40 000 | 1,093 | 3,265 | 1262 100 | 64 106 |
| 28.000 30.000 32.000 34.000 36.000 40.000 42.000 | 1,295 | 3,645 | 1352 400 | 62.758 |
| 44.000 | 1.519 | 4.047 | 1447,100 | 61.444 |
| 46.000 | 1,768 | 4,472 | 1544 900 | 60 166 |
| 48.000 | 2.044 | 4,918 | 1647,300 | 58 922 57 717 |
| 50.000 | 2,347 | 5,388 | 1754 500 | 57,717 56,548 |
| 2 6 000 | 2.680 | 5,882 | 1866,800 | |
| 54 000 56 000 | 3,044 | 6,400 | 1984 500 | 54 325 |
| 56,000 | 3.441 3.873 | 6,944 | 2108 300 | 53 272 |
| 58 000' | 4,344 | 7,513 | 2238 400 | 52 135 |
| 00.000 | 4,859 | 8,107 | 2375 100 | 55,418 54,325 53,272 52,135 50,822 49,380 47,647 46,247 46,247 44,598 42,912 41,194 |
| 62,000 | 5.422 | 8,725 9,345 | \$518,400 | 49,380 |
| 0000 | 6,036 | 9.365 | | 47 847 |
| | 6.706 | 10.027 | 2826 300 | 46,247 |
| 68,000 | / 9.54 | 11 408 | 5441 500 | 44 598 |
| 68 000 70 000 72 000 | 8 226 | 10 708 11 409 12 126 12 858 | 3163 /00 | 42,912 |
| 72,000 | 9.085 | 12 858 | 3531 900 | 41 194 |
| / T . UOO | 10,015 | 13,302 | 3737 900 | 39°447 37°672 |
| 10,000 | 11,020 | 14 357 | 3021 700 | 37,672 |
| ,0",000 | 12,104 | 13,502 14,397 15,118 15,882 16,645 | 2991 200 3163 700 3343 900 3531 900 3727 900 3931 900 4143 900 4364 000 4592 000 | 35 866 |
| 60 06V | 13,270 | 15 882 | 4344 000 | 34.027 32.148 30.225 |
| °2,000 | 14,524 | 16.645 | 4592 000 | 32,148 |
| 84.000 | 15,868 | 17,402 | 4592 000 4827 800 | 30,225 |
| | - " | | +0£1,000 | 28 249 |

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TABLE 24. (CONT'D)

| TIME | RANGE | | | |
|---|---|----------|--|--------------------|
| FROM | FROM | | | 047 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 86.000 | 17.307 | 18.147 | 5071.000 | (DEG) |
| 88,000 | 18,844 | 18,874 | 5321,200 | 26.210 |
| 90,000 | 20.484 | 19,575 | 5578 000 | 24,098 |
| 92,000 | 22,227 | 20,241 | 300 | 21,910 |
| 92,000 94,000 | 24,078 | 20 865 | 5578 000 5841 300 6111 200 6388 200 6674 100 | 19,647 |
| 96,000 98,000 100,000 | 26,038 | 21,435 | 4388 200 | 17,312 |
| 98,000 | 28,109 | 21,944 | 6536 EUU | 14,914 |
| 100,000 | 30,292 | 22,381 | 6970.400 | 12,465 |
| 102,000 | 32,589 | 22,737 | 7280 500 | 9,988 |
| 102 000 104 000 106 000 | 35,001 | 23,004 | 7608 50¢ | 7.506 |
| 106,000 | 37,533 | 23,175 | 7050 444 | 5.050 |
| 108,000 | 40 187 | 23,245 | 7959 400 8338 600 | 2,655 |
| 110,000 | 42.970 | 23,208 | 8756,000 | 355 |
| 112,000 | 45 898 | 23,077 | 0120,000 | -1.754 |
| 114,000 | 45 898 48 989 | 22,876 | 9243 300 9782 300 | -3,206 |
| 108 000 110 000 112 000 114 000 116 000 | 52 368 | 55 630 | 10361 200 | _4_057 |
| 118.000 | 55.845 | 22:352 | 10977.100 | _4 399 |
| 120.000 | 59.527 | | | _4,681 |
| 122.000 | 63•433 | 22.032 | 11637.900 | -4.98 0 |
| 124.000 | 67.574 | 21.677 | 12342.000 | ~5• 156 |
| | 4,4514 | 51.305 | 13099.500 | * 5•366 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 70.606 | 21.011 | 13400,100 | -5,507 |
| 126.000 | 71.914 | 24 494 | | |
| 128.000 | 76.256 | 20.884 | 13377.300 | ~5 ,566 |
| 130.000 | _ | 20.450 | 13288.300 | -5. 766 |
| 132.000 | 80•565 84•840 | 20.005 | 13188.800 | -5.968 |
| 134.000 | 89.475 | 19.548 | 13077.300 | -6.173 |
| 136.000 | 89. ₀ 75 93.265 | 19.079 | 12951.900 | -6.381 |
| 138.000 | 97.406 | 18.600 | 12810.900 | - 6.592 |
| 140.000 | | 18.111 | 12651.800 | -6.808 |
| 142.000 | 101•490 105•511 | 17.613 | 124/2.500 | -7.028 |
| 144.000 | 109.460 | 17.107 | 12269.800 | -7.254 |
| 146.000 | | 16.594 | 12041.000 | ~7.486 |
| 148.000 | 113·32 ⁹ 11 ⁷ ·110 | 16.075 | 11785.900 | -7.726 |
| 150.000 | | 15.551 | 11502.500 | -7.974 |
| 152.000 | 120.791 | 15.025 | 11188.900 | -8.231 |
| 154 • 000 | 124•365 127•8 ₁ 9 | 14.497 | 10844.000 | -8.500 |
| 156-000 | | 13.970 | 10467-200 | -8. 782 |
| 158.000 | 131.144 | 13:446 | 10059 • 100 | ~9 •078 |
| 160.000 | 134.329 | 12:926 | 9620•900 | •9•392 |
| 162.000 | 137.366 | 12.413 | 9152 • 100 | - 9•726 |
| 164.000 | 140.243 | 11.909 | 8655.600 | - 10.084 |
| 1-4-000 | 142.954 | 11•416 | 8137.100 | -10.468 |
| | | | | |

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TABLE 24. (CONT'D)

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| TIME | RANGE | | | |
|--|--|-------------------------|---|-------------------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 166.000 | | 10.936 | 7603.400 | |
| 168,000 | 145.492 147.853 | 10,471 | 7663 500 | -10.883 |
| 170,000 | 150,038 | 10.023 | 7063.500 6527.000 | -11,334 |
| 172,000 | 152 048 | 9,591 | 6002,300 | _11_827 _12_366 |
| 172.000 174.000 | 152 048 153 889 155 567 157 091 | 9 177 | 5496 500 | 12 050 |
| 176,000 | 155 567 | 8 780 | 5496 500 5013 200 | 13,410 |
| 176,000 178,000 | 157.091 | 9 177 8 780 8 400 | 4556 600 | _12 958 _13 610 _14 330 |
| 180,000 | 158,469 | 8.037 | 4126 800 | 15 125 |
| 182,000 | 158,469 159,711 | 7,691 | 4126 800 3727 800 3362 200 | 15, 125 |
| 184,000 | 160,827 | 7,360 | 3362 200 | _16,006 _16,982 |
| 186,000 | 161,827 | 7.044 | 3029,500 | -18,063 |
| 188,000 | 162,722 | 6.741 | 2728 300 | 19 259 |
| 190,000 | 163,522 | 6.741 6.451 | 2728 ³ 00 2454 ⁰⁰⁰ | -19 ²⁵⁹ |
| 172,000 | 164,235 | 6,173 | 2206 600 1984 100 1788 100 | _20_580 _22_040 |
| 194,000 | 164,869 | 5,906 | 1984 10C | 23 648 |
| 194 000 196 000 | 164,869 165,432 | 5.649 | 1788°100 | 25 415 |
| 198,000 | 102,433 | 5,649 5,400 | 1619 600 | _23 648 _25 415 _27 343 |
| 200,000 | 166.380 166.778 | 5,159 | 1472 800 1345 700 1236 900 | -29 430 |
| 202,000 | 166,778 | 4,923 | 1345 700 | _31,674 |
| 204,000 | 167,134 | 4 693 | 1236 900 | .34 063 |
| 206,000 | 167,453 | 4_467 | 1144 100 | _36,581 |
| 206 000 208 000 | 167 453 167 740 168 001 | 4 244 4 021 | 1070 300 | _39 203 |
| 510,000 | 168,001 | 4 021 | 1018 000 | _39 203 _41 879 |
| 210 000 212 000 214 000 216 000 | 168,240 | 3,790 | 1018 000 980 800 | _44 560 |
| 214,000 | 168,461 168,667 168,859 | 3 567 3 335 | 954°30ò | _47 205 |
| 216,000 | 168 667 | 3 335 | 935,200 | 49,783 |
| 510,000 | 168 859 | 3.097 | 921 300 | _49 783 _52 274 |
| 222,000 | 169,038 169,206 169,362 | 2,855 | 911[000 | " 54 662 |
| 222.000 | 169,206 | 2,608 2,357 | 903 300 897 300 | _56,940 |
| 224,000 | 169,362 | 2 357 | 897 300 | _59 102 _61 149 |
| 226,000 | 102 202 | 2,101 | 892 600 | _61_149 |
| 558,000 | 169,646 | 1,842 | 888 600 | # 63_080 |
| 228 000 230 000 | 169 646 169 774 | 1.580 | 885 100 | _64 898 _66 608 |
| 232,000 | 194 833 | 1,315 | 881 900 | -66 608 |
| 234,000 | 170.004 | 1.047 | 878_800 | -08,213 |
| 236.000 | 170.108 | .778 | 875,600 871,100 | -69,/19 |
| 238,000 | 170,204 | .507 | | -71,130 |
| 240,000 | 170.294 | .235 | 864,800 | -72,455 |
| 241,733 | 170.365 | 0.000 | 858,267 | - 73 . 537 |
| | | | | |

| TABLE 25. | TRAJECTORY | T3N.50 | (70) |
|-----------|------------|--------|------|
| RANGE | | | |
| FROM | | | |

| | TABLE 25. | TRAJECTOR | Y T3N.50 (70) | |
|------------------|----------------|--------------------|----------------------|---|
| TIME | RANGE | | (13) | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90.000 |
| 4 000 6 000 | 0.000 | .024 | 85 000 | 90 000 |
| | 0.000 | •061 | 135.800 | 90.000 |
| 8.000 | 0.000 | •114 | 188.300 | 90.000 |
| 10.000 12.000 | •005 | •185 | 243.000 | 84-128 |
| 14.000 | •015 | •273 | 299.800 | 82.554 |
| 16.000 | •031 | •380 | 358.900 | 80.949 |
| 18.000 | •053 | •507 | 420-400 | 79.329 |
| 20.000 | •082 •121 | •653 | 484.000 | 77.706 |
| 22.000 | •170 | .818 | 550.600 | 76.091 |
| 24.000 | •230 | 1.004 | 619.300 | 74.494 |
| 26.000 | •304 | 1.211 | 691.000 | 72.914 |
| 28.000 | •392 | 1 • 439 1 • 689 | 765.600 | 71.363 |
| 30.000 | •496 | 1.961 | 843.300 | 69.843 |
| 32.000 | •617 | 2.254 | 924.000 1005.600 | 68,357 |
| 34.000 | •756 | 2.569 | 1089.200 | 66.904 |
| 36.000 | .914 | 2.907 | 1174.500 | 65.488 |
| 38.000 | 1 • 0 9 3 | 3.265 | 1262.100 | 64.106 |
| 40-000 | 1.295 | 3.645 | 1352.400 | 62.758 |
| 42.000 | 1.519 | 4.047 | 1447.100 | 61.444 |
| 44.000 | 1.768 | 4.472 | 1544.900 | 60•166 58.922 |
| 46.000 | 2.044 | 4.918 | 1647,300 | 57.717 |
| 48.000 | 2.347 | 5•388 | 1754.500 | 56.548 |
| 50.000 | 2•680 | 5•882 | 1866.800 | 55.418 |
| 52.000 | 3.044 | 6•400 | 1984.500 | 54+325 |
| 54.000 | 3.441 | 6.944 | 2108.300 | 53 • 155 |
| 56.000 | 3.876 | 7.511 | 2238.300 | 51.751 |
| 58.000 60.000 | 4.353 | 8.100 | 2374.700 | 50 • 171 |
| 62.000 | 4.876 | 8.711 | 2517.700 | 48.463 |
| 64.000 | 5•450 6•079 | 9.340 | 2667.700 | 46.663 |
| 66.000 | 6.766 | 9.987 | 2824.700 | 44.797 |
| 68.000 | 7.517 | 10.650 | 2989.000 | 42.884 |
| 70.000 | 8.333 | 11.326 | 3160.700 | 40.933 |
| 72.000 | 9.212 | 12•012 12•720 | 3341.200 | 39.144 |
| 74.000 | 10.152 | 13.456 | 3535.300 3737.800 | 38.328 |
| 76.000 | 11.155 | 14.220 | 3948.900 | 37•55 ₀ 36•6 ₀ 8 |
| 78.000 | 12.224 | 15.014 | 4169.100 | 36.101 |
| 80•000 | 13.362 | 15.838 | 4398.800 | 35.427 |
| 82.000 | 14.571 | 16,693 | 4638.200 | 34.786 |
| 84.000 | 15.855 | 17.580 | 4887.900 | 34-175 |
| | | | ~ ~ | |

| TABLE 25. | (CONT'D) |
|-----------|----------|
| RANGE | |

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Section 1

| | TABL | E 25. (CONT | ¹ D) | |
|------------------|--|--|------------------------|--------------------------------------|
| TIME | RANGE | | | |
| FROM | FROM | | • | DATE |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 86.000 | 17.217 | 18.501 | 5148.300 | (DEG) |
| 88,000 | 18,661 | 19,456 | 5420.000 | 33.594 33.041 |
| 90.000 | 20 188 | 20,446 | 5703 600 | 32,041 |
| 92 000 94 000 | 21.804 | 21,474 | 5999 700 | 35,014 |
| 94,000 | 23,512 | 22,541 | 6309 200 | 32,516 32,016 31,542 31,091 |
| 96,000 | 25,316 | 23,648 | 6633 800 | 31 091 |
| 98,000 | 20 188 21 804 23 512 25 316 27 220 29 229 31 348 33 581 35 936 | 24,797 | 6972 400 | 30,664 |
| 100 000 | 29 229 | 25,989 | 7327 900 | 30,259 |
| 102,000 | 31 348 | 27 228 | 7700 800 | 29 876 |
| 104.000 | 33,581 | 28 515 | 8092 700 | 29.514 |
| 106.000 | 35.938 | 29.854 | 8505,300 | 29:173 |
| 108-000 | 38•417 | 31 • 246 | 8940.500 | 28.851 |
| 110.000 | 41.031 | 32+695 | 9400.800 | 28.548 |
| 112.000 | 43.787 | 34.205 | 9888.700 | 28.264 |
| 114.000 | 46.692 | 35.779 | 10407.500 | 27.999 |
| 116.000 | 49.854 | 37.423 | 10960-800 | 27.751 |
| 118.000 | 53.099 | 39+141 | 11553.300 | 27.521 |
| 120.000 | 56•5 <u>2</u> 7 | 40•939 | 12190-400 | 27.309 |
| 122.000 | 60 • 151 | 42.825 | 12878.900 | 27.113 |
| 124.000 | 63•986 | 44.806 | 13627.200 | 26.935 |
| BURN-OUT | OF STAGE | 1 AT | • | |
| 125.400 | 66.791 | 46.246 | 13926.100 | 24 404 |
| | | 100210 | 13920.100 | 26.820 |
| 126.000 | 68.002 | 46.866 | 13917.600 | 24 171 |
| 128,000 | 72,035 | 48,921 | 13889 400 | 26.771 |
| 130,000 | 76,063 | 50.961 | 13861 400 | 26,608 26,444 |
| 140 000 | 96,133 | 50.961 60.923 | 13724 600 | 25,615 |
| 150,000 | 116,092 | 70,491 | 13592 700 | 24 171 |
| 160,000 | 135 945 | 79,670 | 13465 700 | 23 912 |
| 1/0 000 | 135,945 155,697 | 70 491 79 670 88 458 96 859 104 873 112 504 | 13465 700 13343 550 | 53,038 |
| 180,000 | 175,353 194,918 214,397 | 96 859 | 13226 300 | 23,038 22,151 |
| 120,000 | 194,918 | 104 873 | 13114 025 | 21,249 |
| 200,000 | 214,397 | 112,504 | 13006,700 | 20,333 |
| 210,000 | 233,794 | 119,750 | 12904 350 | 19,403 |
| 220.000 | 253,115 | 126,615 | 12807,100 | 18,460 |
| 230.000 | 272,364 | 133,099 | 12714,831 | 17,505 |
| 240.000 | 291,546 | 139.203 | 12627,700 | 16,536 |
| 250,000 | 310,664 | 144,930 150,278 155,250 | 12545,606 | 15,556 |
| 260,000 | 329,723 348,727 | 150.278 | 15400 000 | 14.564 |
| 270,000 | 348,727 | 155,250 | 1239/100 | 13,562 |
| 280.000 | 367,681 | 159.848 | 12330_600 | 12,549 |
| 290.000 | 386,589 | 159.848 164.069 167.918 | 15502 301 | 11,527 |
| 300,000 | 405,454 | 167,918 | 12213,500 | 10,495 |
| | | | | |

TABLE 25. CONT'D)

| TIME | RANGE | | | |
|--|---------------------------------|------------------|-------------------------------------|-----------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | WEL CATEM | PATH |
| (SEC) | (NMI) | (IME) | VELOCITY | ANGLE |
| 310.000 | 424.281 | | (FT/SEC) | (DEG) |
| 320,000 | 443.075 | 171.393 | 12162.806 | 9•455 |
| 330 000 | 461,837 | 174,495 | 12117,500 | 8,408 |
| 340,000 | 480.574 | 177,225 | 12117,500 12077,613 | 7,353 |
| 330,000 340,000 350,000 | 499 288 | 179,583 | 12043,100 | 6 294 |
| 360 000 | 517 003 | 181,571 | 12043 100 12013 906 | 5 228 |
| 360.000 370.000 | 577,983 536,663 | 183,187 | 11330 100 | 4 159 |
| <i>3</i> 80,000 | 555 333 | 184,432 | 112/1-02/ | 3,085 |
| 390,000 400,000 410,000 | 555 333 573 994 | 185,308 | 11958,900 | 2,010 |
| 400,000 | 573,996 592,655 | 185,814 | 11951 556 11949 500 | 933 |
| 410,000 | 592 655 611 315 | 185,948 | 11949 500 | - 146 |
| 420,000 | 611,315 | 185,713 | 4 1 / J J . V 1 E | -1,224 |
| 430 000 | 629,979 648,651 | 185,108 | 11961,900 | -2,301 |
| 440 000 | 648,651 | 184,132 | 11961 900 11976 250 11996 000 | -3,376 |
| 420,000 430,000 440,000 450,000 | 667 336 686 036 | 182 787 | 11996 000 | _4 448 |
| 460.000 | | 181.070 | 12021,262 | -5.517 |
| 470.000 | 704 • 755 733 • 408 | 178.982 | 12051 • 900 | *6.581 |
| 480.000 | 723•498 | 176.524 | 12087.856 | - 7.639 |
| 490.000 | 742.269 | 173.693 | 12129.300 | -8.692 |
| 500-000 | 761 • 071 | 170-490 | 12175.981 | -9.737 |
| 510.000 | 779.9 ₀ 8 | 166.914 | 12228.190 | -10.775 |
| 520.000 | 798.785 | 162,965 | 12285.406 | -11.804 |
| 530.000 | 817.704 | 154.642 | 12348.100 | -12.824 |
| 540.000 | 836.673 | 153.943 | 12415.925 | -13.834 |
| 550.000 | 835+690 874•765 | 148-869 | 12489.000 | -14.834 |
| 560.000 | 893.899 | 143.419 | 12567.275 | -15.822 |
| 570.000 | | 137.590 | 12650.700 | -16.799 |
| 580.000 | 913•098 933-347 | 131.383 | 12739.225 | -17.764 |
| 590.000 | 932•367 951•7 ₀ 8 | 124.796 | 12832.900 | -18.716 |
| 600.000 | 971-127 | 117.829 | 12931.525 | -19.656 |
| 610.000 | 990.629 | 110.478 | 13035.200 | -20.582 |
| 620.000 | 1010.218 | 102.745 | 13143.925 | -21.494 |
| 630.000 | 1058.838 | 94.626 | 13257.500 | -22.392 |
| 640.000 | 1049-678 | 86.150 | 13376.119 | -23.276 |
| 650-000 | 1069-559 | 77.227 | 13499.500 | -24-146 |
| 660.000 | 1089.547 | 67.943 | 13627.869 | -25.001 |
| 670-000 | 1109.649 | 58.268 | 13761-000 | -52•84U |
| 672-000 | 1113.683 | 48.200 | 13899.119 | ~26.66Š |
| 674 • 909 | 1117.722 | 46,139 | 13926.900 | - 26.828 |
| 676 • 000 | 1111126 | 44.062 | 13955 • 625 | - 26•99 ¹ |
| 678.000 | 1121.766 | 41.970 39.861 | 13983 - 100 | °27•153 |
| 680,000 | 1129 847 | 37,001 | 14012,450 | -61,314 |
| 682,000 | 1129,867 1133,926 | 37,737 | 14038 500 | _27_475 _27_635 |
| 4 · • - | | 35,596 | 14067,975 | <u> </u> |
| | | | | |

TABLE 25. (CONT'D)

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- Transport

| TIME | RANGE | | | |
|---|--|------------------|--|---|
| FROM | | | | |
| LAUNCH | FROM | | | PATH |
| (SEC) | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| | (NMI) | (NMI) | (FT/SEC) | |
| 684 • 000 | 113/-986 | 33.442 | 14090.300 | (DEG) |
| 686.000 | 1147 APE | 31,272 | 14119 800 | -27.795 |
| 688,000 | 1146,119 | 29,087 | 14172 100 | -27,953 |
| 690,000 | 1150,188 | 26,889 | 14119.800 14132.100 14144.600 | -28,113 |
| 692,000 | 1154,255 | 24,677 | 14144 000 | -28,271 |
| 694,000 | 1158 317 | 22,456 | ***** | -28 430 -28 588 |
| 696,000 | 1162 364 | 20,230 | 14125,700 | -28,588 |
| 000 000 | 1146,119 1150,188 1154,255 1158,317 1162,364 1166,381 1170,338 | 18,006 | 14066,200 | -28,747 |
| 700.000 | 1170 338 | 15,803 | 13932 400 | -28 909 |
| 702,000 | 1174,182 | 12 440 | 13659 100 | -29 074 |
| /DA DAD | 1177,830 | 13,649 11,591 | 13154 600 | -29 248 |
| 706,000 | 1181,166 | 11,371 | 12296 300 | -29,437 |
| 708,000 | 1184.068 | 9.695 | 10996 000 | -29,655 |
| 710,000 | 1186,457 | 8.030 | 9323 300 | -29,920 |
| 706.000 708.000 710.000 712.000 714.000 | 1188,327 | 6,644 | 7482,600 | -29 248 -29 437 -29 655 -29 920 -30 260 -30 711 -31 311 |
| 714,000 | 1189,757 | 5,541 | 5777,500 | -30,711 |
| 716.000 | 1190.849 | 4,681 | 4433,800 | -31 311 |
| 718.000 | 1191.691 | 4.007 | 3424,100 | -32.099 |
| 720.000 | 1192.346 | 3.469 | 2685.800 | -33-111 |
| 722-000 | 1192.864 | 3.031 | 2135.400 | -34 • 382 |
| 724.000 | 11,5,004 | 2.668 | 1730-700 | -35.945 |
| 726.000 | 1193.278 | 2:357 | 1433-200 | -37.813 |
| 728.000 | 1193.616 | 2.085 | 1215-100 | -39.986 |
| 730,000 | 1104 140 | 1,839 | 1815.100 | -42,422 |
| 732,000 | 1134,145 | 1,605 | 990 500 | -45,009 |
| 734 000 | 1194,361 | 1,376 | 940 800 | 47 645 |
| 734,000 | 1194,560 | 1,146 | 909 300 | |
| 736,000 | 1194,744 | ,915 | 888 700 | -50 260 |
| 738,000 | 1194, 142 1194, 361 1194, 560 1194, 744 1194, 914 1195, 073 1195, 219 1195, 331 | .680 | 990 500 940 800 909 300 888 700 875 000 863 300 852 200 843 350 | -52.807 |
| 740,000 | 1195,073 | .442 | 863°3nn | -55,259 57,601 |
| 742 000 743 650 | 1142,514 | 200 | 852 200 | -57.601 |
| , 43 0 0 0 0 | 1195.331 | 0.000 | 843.350 | -59 829 |
| | | ÷ | | -61,582 |

TABLE 26. TRAJECTORY T3N.50 (80)

| TIME | RANGE | | | |
|--|----------------------------|--|---|--|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35,900 | 90,000 |
| 4,000 | 0 000 | .024 | 85,000 | 90,000 |
| 6.000 | | .061 | 135 800 | 90 000 |
| 8 000 10 000 12 000 | 0,000 | 114 | 188 300 | 90,000 |
| 10,000 | 005 | 185 | 243 000 | 84 128 |
| 12,000 | .015 | 273 | 299 800 358 900 420 400 484 000 | 84,128 82,554 80,949 79,329 77,706 76,091 74,494 |
| 14.000 | .031 | .380 | 358,900 | 80,949 |
| 16,000 | ,053 | .507 | 420,400 | 79.329 |
| 18,000 | .082 | ,653 | 484,000 | 77,706 |
| 20,000 | .121 | 818 | 550 600 619 300 691 000 | 76.091 74.456 |
| 22,000 | 170. | 1,004 | 617,000 | 72 914 |
| 20,000 22,000 24,000 26,000 | 230 | 1,211 1,439 | 765 600 843 300 924 000 1005 600 1089 200 1174 500 1262 100 | 71 363 |
| 20,000 | 304 | 1,437 | 765,000 | 11,303 |
| 28,000 | ,392 404 | 1.689 1.961 | 094 000 | 71 363 69 843 68 357 |
| 30,000 | .496 | 1,961 | 1005 A00 | 66,904 |
| 32.000 | .617 .756 | 2,254 2,569 | 1005,000 | 65.488 |
| 34,000 | 914 | 2,907 | 1174 500 | 64,106 |
| 36,000 38,000 | 1.093 | 3,265 | 1262 100 | 62,758 |
| 40,000 | 1.295 | 3,645 | 1352 400 | 61,444 |
| 42 000 | 1.519 | 4.047 | 1352,400 1447,100 | 60 166 |
| 44 000 | 1,519 1,768 | 4,472 | 1544 900 | 60 166 58 922 |
| 46 000 | 2.044 | 4,918 | 1647 300 | 57,717 |
| 48 000 | 2.044 2.347 | 4,918 5,388 | 1754 500 | 56 548 |
| 50,000 | 2,680 | 5 882 | 1044 BAA | 55,418 |
| 44 000 46 000 48 000 50 000 52 000 54 000 56 000 58 000 | 3.044 | 6 400 | 1984 500 | 55 418 54 325 |
| 54 000 | 7 441 | 6 944 | 2108 300 | 53~155 |
| 56,000 | 3 876 4 353 | | 2238,300 | 51 751 |
| 58,000 | 4 353 | 8,100 | 2374.700 2517.700 | 50,171 |
| 60,000 | 4,876 | 8.711 | 2517,700 | 48,463 |
| 62,000 | 5,450 | 9,340 | 2667,700 | 46,663 |
| 64,000 | 6,079 | 9 987 | 2824,700 | 44,797 |
| 66,000 | 6,766 | 10,650 | 2989,000 | 42,884 |
| 68,000 | 7,517 | 11 326 | 2989 000 3160 700 | 40 933 38 951 |
| 70,000 | 8,333 | 12.012 | 3340 000 | 38,951 |
| 68,000 70,000 72,000 | 7 517 8 333 9 221 | 12.012 12.707 13.407 14.108 14.806 | 3526 900 3721 500 | 36,941 36,941 34,905 32,842 |
| 74 000 76 000 78 000 | 10 182 11 222 12 343 | 13,407 | 3721 500 3924 000 | 39,705 |
| 70,000 | 11.222 | 14,108 | 7454 5VY | 30 762 |
| 78,000 | 12,343 | 12,400 | 4134 200 4355 000 | 30,136 |
| 00.000 | 13,047 | 13,475 | 4355 VVV | 28 192 27 998 |
| 82,000 | 14.839 | 16,197 | 4599 700 4854 900 | 27,337 |
| 84,000 | 16,208 | 16,920 | 4034°,400 | 21,001 |

TABLE 26. (CONT'D)

RANGE FROM

TIME

| LIME | RANGE | | | |
|--|----------------------------|--------------------------------------|---|----------------------------|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 17.661 | 17.665 | 5120.700 | |
| 88.000 | 19.201 | 18.435 | 5397.700 | 26.709 |
| 90 000 | 20 832 | | 53714100 | 26.113 |
| 92,000 | 22,556 | 19,230 20,050 | 5686 600 | 25,546 |
| 94 000 | 24 378 | 20,030 | 5988 000 | 25,546 25,010 |
| 94 000 96 000 98 000 100 000 | 24,378 | 20 896 | 6302 800 | 24 502 24 020 23 565 |
| 98 000 | 26,303 | 21,771 | 6631 800 | 24 020 |
| 100 000 | 28,334 | 22,6/4 | 6977 400 | 23 565 |
| 100,000 | 30,478 | 23 608 24 572 | 7337 800 | 23 133 |
| 105 000 | 32,737 | 24,572 | 7716°700 | 22,126 |
| 104,000 | 35,120 | 25,571 26,604 | | 22 342 |
| 100 000 | 37,630 | 26,604 | 8533 200 | 21 470 |
| 108,000 | 40,276 | 27 674 | 8974 500 | 21,479 |
| 110,000 | 43.063 | 28 783 | 9440 | 21,638 |
| 112,000 | 46,001 | 20,034 | 9935 104 | 21,318 |
| 114,000 | 49.097 | 27 674 28 783 29 934 31 130 | 7735 17V | 21,018 |
| 116 000 | 52,471 | 32,130 | 10400 100 | 20,738 |
| 118 000 | 55 929 | <u>32</u> ,374 | 8114 600 8533 200 8974 500 9440 900 9935 106 10460 100 11019 800 11618 600 | 20,477 |
| 120 000 | 59 502 | 33,669 | 11010 200 | 20,235 |
| 122 000 | 59 582 63 443 | 35 020 36 433 | IEEOE IUU | 20 011 19 806 |
| 118 000 120 000 122 000 124 000 | 47°500 | 30,433 | 12957 100 | 19,806 |
| | 6? 529 | 37,913 | 13712 000 | 19 619 |
| BURN-OUT | OF STACE | • • | | • |
| DONNAGOL | OF STAGE | 1 AT | | |
| 125 444 | 70 507 | | | |
| 125.400 | 70.517 | 38,986 | 14015,400 | 19,498 |
| | | | | |
| 126 000 | | | | |
| 126.000 | 71.807 | 39.447 | 14008.800 | 19.446 |
| 128.000 | 76.104 | 40.975 | 13986.900 | 19.275 |
| 130.000 | 80,396 | 42,487 | 13965,500 | 19 103 |
| 132,000 | 84,685 | 43,983 | 13944 600 | 18 931 |
| 134,000 | 88 970 | 45,465 | 13924 100 | 18 758 |
| 132 000 134 000 136 000 | 84 685 88 970 93 252 | 46.931 | 13903,900 | 18.585 |
| 138.000 | 97.530 | 48.382 | 13883.900 | |
| 140.000 | 101.804 | 49.818 | | 18.411 |
| 142.000 | 106.075 | | 13864 • 100 | 18.237 |
| 152.000 | 127.377 | 51 • 239 | 13844.600 | 18.062 |
| 162.000 | 148.598 | 58.113 | 13750 • 100 | 17.183 |
| 172.000 | 169.743 | 64.610 | 13660.700 | 16.293 |
| 182.000 | | 70.729 | 13576.200 | 15.392 |
| 192.000 | 190.817 | 76.471 | 13496.700 | 14.481 |
| 303-000 | 211.825 | 81.838 | 13422.200 | 13.561 |
| 202.000 | 232.770 | 86.831 | 13352.725 | 12.632 |
| 212.000 | 253 • 659 | 91 • 450 | 13288.300 | 11.694 |
| 555.000 | 274 • 495 | 95.697 | 13228.950 | 10.748 |
| 232.000 | 295 • 285 | 99.571 | 13174.700 | 9.794 |
| 242.000 | 316.030 | 103.074 | 13125.600 | 8.834 |
| 252.000 | 336•737 | 106.206 | 13081.600 | 7.868 |
| | | 106 | • • | |
| | | 1116 | | |

TABLE 26. (CONT'D)

| TIME | RANGE | • | • | |
|--|---|--------------------|--|--|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | WEL OATEN | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 262.000 | 357.409 | | (FT/SEC) | (DEG) |
| 272.000 | 378.052 | 108-968 | 13042.687 | 6.895 |
| 282 000 | 398 668 | 111,360 | 13009,000 12980,425 | 5,918 |
| 292,000 | 419,264 | 113,383 115,037 | 12767 725 | 4,937 |
| 302,000 | 439 843 | 114 222 | 12957 100 12938 900 | 3,952 |
| 312,000 | 460 408 | 116,323 117,240 | 12730 700 | 2,964 |
| 322,000 | 480,966 | 117 789 | 12925 900 | 1,974 |
| 332,000 | 501,519 | 117,788 117,969 | 12918 175 | 982 |
| 342 000 | 522,072 | 117,781 | 12915 600 | 010 |
| 352,000 | 542,629 | 117,225 | 12918 256 12926 200 | -1.002 |
| 362 000 | 563,195 | 116 301 | 12926 200 | -1,994 |
| 372,000 | 583,774 | 116,301 115,008 | 12939 250 12957 500 | -2,984 |
| 382,000 | 604,370 | 113,347 | 12080 001 | -3,972 |
| 392,000 | 624 988 | 111,316 | 12980 981 13009 600 | -4,957 |
| 402 000 | 645,630 | 111 316 108 916 | 13043 400 | -5,738 |
| 282 000 292 000 302 000 312 000 322 000 342 000 352 000 362 000 372 000 382 000 392 000 402 000 412 000 412 000 | 666,304 | 106 147 | 13082 400 | _5,938 _6,915 _7,887 |
| 472 000 | 687,011 | 106 147 103 008 | 13126 506 | #1,001 |
| 432,000 | 707.757 | 99,497 | 13126 506 | _8 \ 853 |
| 442,000 | 728,547 | 95,615 | 13175,800 | -9.814 |
| 452,000 | 749,385 | 91,361 | 13289 600 | _10,767 |
| 442 000 452 000 462 000 | 770,274 | 86,735 | 13230 100 13289 600 13354 100 13423 600 | -11,713 |
| 4// 000 | 791,222 | 81,735 | 13423 600 | -12,650 |
| 482,000 | 812,230 | 76,360 | 13498 225 | -13 580 |
| 492,000 | 833,305 | 70,610 | 13577 800 | -14 499 15 410 |
| 502,000 | 854,452 | 64,484 | 13662 400 | 16 310 |
| 215.000 | 875,675 | 57,980 | 13751 900 | 15 410 16 310 17 201 |
| 482.000 492.000 502.000 512.000 522.000 | 896,978 918,369 | 51.097 | DOE AAREL | -16 080 -18 948 -19 120 -19 292 |
| 532,000 | 918,369 | 43,835 | 13945 000 | _18 948 |
| 532,000 534,000 536,000 538,000 540,000 542,000 | 726,058 | 42,337 | 13965 344 | _19 120 |
| 536,000 | 926,949 | 40.824 | 13984 900 | 19, 292 |
| 540 000 | 931 245 935 544 939 847 944 151 | 39,296 | 14005 362 | |
| 542 000 | 935,544 | 37,752 | 14024 200 14044 481 | _19 635 |
| 544 000 | 939,847 | 36,193 | 14044 481 | 19 635 19 805 |
| 546 000 | 947,151 | 34,620 | 14061 200 | 10 072 |
| 548 000 | 740,401 | 33,031 | 14560 425 | _20_144 |
| 550 000 | 952 107 | 31,428 | 14093 100 | _20_314 |
| 544 000 546 000 548 000 550 000 552 000 | 961 303 | 29 807 | 14109 800 | _20 144 _20 314 _20 483 |
| 554 000 | 944 151 948 461 952 769 957 084 961 393 965 704 970 012 974 313 978 601 | 28,179 | 14113 800 | 20 652 20 821 |
| 556 000 | 970 012 | 26,533 | 14116 200 | -50.851 |
| 558 000 | 974 313 | 24 876 23 207 | 14109 600 | 20 990 |
| 560 000 | 978 6A1 | 23,201 | 14088 400 | 21 159 21 328 |
| 560 000 562 000 | 982 867 | 21,529 | 14043 800 | _21_328 |
| | , o = 0 0 1 | 19,846 | 13961,700 | 21,500 |

TABLE 26. (CONT'D)

| TIME | RANGE | | | |
|---|--|--------------------------|----------------------|--------------------------------|
| FROM | FROM | | | 0474 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 564.000 | 987 • 098 | 18.163 | 13819.100 | (DEG) |
| 566,000 | 991.268 | 16,490 | 13580.200 | -21-673 |
| 568,000 | 995_341 | | 13198 700 | -21.851 |
| 570,0C3 | 999,267 | 14,841 13,238 | 12621 600 | -22,036 |
| 572.000 | 1002 478 | 11,708 | 11796 900 | -22,233 |
| 3/4_000 | 1006 393 | 10 284 | 10706 000 | -22 448 -22 692 |
| 576,000 | 1009,440 | 8 998 | 9404 300 | 22,977 |
| 216 000 | 1012,066 | 10 284 8 998 7 873 | 7984 500 | _23°322 |
| 580 000 | 1014 258 | 6,917 | 6587°600 | 23,749 |
| 582.000 | 1006 393 1009 440 1012 066 1014 258 1016 043 | 6,121 | 5341 600 | 24 286 |
| 584,000 | 1017,479 | 5,462 | 4304 900 | 24 060 |
| 586,000 | 1018,630 | 4,916 | 3482 200 | _25_801 _26_835 |
| 588,000 | 1019,559 | 4,457 | 2844 800 | -26 H35 |
| 590,000 | 1020,313 | 4,065 | 2344 600 | -28 089 |
| 584 000 586 000 588 000 590 000 592 000 594 000 596 000 | 1020,929 | 3,726 | 1951 000 | 29 589 |
| 594,000 | 1021.438 | 3,427 | 1648 400 | 31 353 |
| 596,000 | 1021 865 | 3 158 | 1412 300 | _33 387 |
| | 1022,219 | 2,913 | 1230 000 | 35 686 |
| 000_000 | 1022,219 1022,523 | 2,684 | 1230 000 1096 000 | 38 223 |
| 602,000 | 1022 790 1023 030 1023 249 1023 451 1023 638 | 2,464 | 1013 100 | 40 919 |
| 604 000 | 1023,030 | 2,246 | 961,000 | 43 680 |
| 606 000 | 1023,249 | 2,026 | 926 900 | 46 435 |
| 606,000 | 1023,451 | 1,803 | 904 200 | 49 136 |
| 608 000 610 000 612 000 | 1023,633 | 1,576 | 888 800 | 51 75A |
| 612,000 | 1053 013 | 1,343 | 878 500 | -54 255 |
| 614,000 | 1023.977 | 1,196 | 871 400 | .54 .255 56 .641 58 .900 |
| 010,000 | 1024,129 | 865 | 865 300 | 58,900 |
| 614.000 616.000 618.000 | 1024,271 | 619 370 | 865 300 858 800 | -61 037 |
| 020,000 | 1024,403 | .370 | 851 900 | .61 037 .63 053 |
| 622,000 | 1024,525 | .119 | 844 400 | 204 Y55 |
| 622,938 | 1024,579 | 0.000 | 840 746 | _65_810 |
| | | | - | • |

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| | TABLE 27. | ጥኮን ነው ለመለተ | 167 M 757 CO 4 | |
|----------------------------|-----------|------------------|----------------------------------|--------------------------------------|
| TIME | | TIMOECTOR | XY T3N.50 (85) | |
| FROM | RANGE | | | |
| LAUNCH | FROM | | | 24.0 |
| 16501 | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | 127/250 | ANGLE |
| 0.000 | 0.000 | | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| Á 060 | | •004 | 35,900 | 90.000 |
| 6 000 | 0.000 | .024 | 85 Qaa | 96 000 |
| 8*000 | 0.000 | .061 | 135 800 | 90,000 |
| 6,000 8,000 | 0,000 | 114 | 188 300 | 90,000 |
| 10,000 | .005 | 185 | 243,000 | 90,000 |
| 12,000 | 015 | | 243,000 | 84 128 |
| 14.000 | .031 | .273 | 299,800 | 82,554 |
| 16,000 | | .380 | 299 800 358 900 | 80,949 |
| 18,000 | .053 | .507 | 420,400 | 79 220 |
| 20 000 | .082 | ,653 | 484 000 | 79,329 |
| 20.000 | .121 | .818 | 420,400 484,000 550,600 | 77,706 |
| 22,000 | .170 | 1,004 | 610°300 | 76,091 |
| 29 000 | .230 | | 619 300 691 000 | 74,494 |
| 50,000 | .304 | 1,211 | 941 000 | 72,914 |
| 28,000 | 392 | 1,439 | 765 600 | 71,363 |
| 26 000 28 000 30 000 | | 1,689 | 843 300 | 69 843 |
| 32,000 | .496 | 1,961 | 924 000 | 69 357 |
| 34.000 | ,617 | 2,254 | 924.00¢ 1005.600 1089.200 | 68,357 |
| 34.000 | .756 | 2,569 | 1089 200 | 66,904 |
| 36,000 | .914 | 2,907 | 1124 500 | 65,488 |
| 38,000 | 1.093 | | 1174,500 1262,100 1352,400 | 64,106 |
| 40,000 | 1,295 | 3,265 | 1505,100 | 62,758 |
| 42,000 | 1,519 | 3,645 | 1352,400 | 61,444 |
| 44.000 | | 4,047 | 1447 100 | 60.166 |
| 46,000 | 1.768 | 4,472 | 1544 900 | 58 422 |
| | 2.044 | 4,918 | 1647,300 | 58,922 |
| 48.000 | 2,347 | 5,388 | 1754 500 | 57,717 |
| 50,000 | 2,68û | 5,882 | 1754 500 1866 800 | 56,548 |
| 50.000 52.000 | 3,044 | 6 400 | 1000 000 | 55_418 |
| 54,000 | 3,441 | 6,400 | 1984 500 | 54,325 |
| 54 000 56 000 | 3,876 | 6,944 | 2108 300 | 53 155 |
| 58,000 | | 7,511 | 2238 300 | 51,751 |
| 60.000 | 4,353 | 8,100 | 2374 700 | 50 171 |
| 62 085 | 4,876 | 8,711 | 2517,700 | 50,171 |
| 62.000 | 5,450 | 9,340 | 2667 700 | 48,463 |
| 64.000 | 6,079 | 9.987 | 2001,100 | 46,663 |
| 66,000 | 6.766 | 10 450 | 2824 700 2989 000 | 44.797 |
| 98 000 | 7,517 | 10,650 | 5484 000 | 42 884 |
| 70,000 | 8 333 | 11.326 | 3160,700 | 40,933 |
| 70,000 72,000 | 9,333 | 15.015 | 3340 000 | 38 951 |
| 74.000 76.000 | 9,221 | 12.012 12.707 | 3526 900 | 38 951 36 941 |
| 76 000 | 10,182 | 13,407 | 3721 500 | |
| 78 000 | 11,222 | 14,108 | 3924 000 | 37 705 |
| 78,000 | 12,343 | 14,806 | 4134 200 | 36,642 |
| 80.000 | 13,549 | 15,498 | 4134 200 | 30,752 |
| 0 <i>2</i> _000 | 14,845 | 16 177 | 4352 200 | 32.842 30.752 28.631 26.478 |
| 84,000 | 16,232 | 16,177 | 45/8,000 | 26,478 |
| • | ,-5 | 16,840 | 4811,700 | 24 201 |

TABLE 27. (CONT'D)

| • | 1 | ABLE 27. (C | ONT'D) | |
|--------------------|--|-------------|-----------|--|
| TIME | RANGE | | • | |
| FROM | FROM | | | BATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE (DEG) |
| 86.000 | 17.715 | 17.483 | 5065.700 | |
| 88.000 | 19.294 | 18,121 | 5344.500 | 22.486 21.457 |
| 90,000 | 20,967 | 18,773 | 5637 600 | 20 450 |
| 92,000 | 22,739 | 19,443 | 5943 200 | 20 030 |
| 94,000 | 20 967 22 739 24 611 26 589 28 677 30 881 | 20,131 | 6261 900 | 20 858 20 297 19 767 |
| 95,000 | 26,589 | 20,837 | 6594 800 | 19 280 |
| 98 000 | 28,677 | 21,565 | 6942 900 | 19 [*] 280 18 [*] 807 |
| .100 000 | 30,881 | 22,311 | 7308 800 | 18 359 |
| 102,000 | 33,206 | 23 080 | 7690 600 | 17 936 |
| 104.000 | 35,655 | 23,871 | 8092 600 | 17,538 |
| 106,000 | 36,238 | 24,686 | 8515,000 | 17,163 |
| 108.000 | 30,881 33,206 35,655 38,238 40,959 43,827 | 25,526 | 8960 300 | 16,811 |
| 110,000 | 43,827 | 26,392 | 9430,600 | 16,480 |
| 112,000 | 45 849 50 135 | 27,287 | 9928 500 | 16,170 |
| 114,000 | 50,135 | 28,213 | 10457 400 | 15,881 |
| 116,000 | 53,508 | 29,172 | 11021 000 | 15 612 |
| 118.000 120.000 | 57.068 | 30,167 | 11623 600 | 15,612 15,363 |
| 122,000 | 60 827 64 801 | 31,201 | 12270 900 | 13 144 |
| 124.000 | 69.007 | 32,277 | 12969 700 | 14 922 |
| | 6,001 | 33,401 | 13728 300 | 14°729 |
| BURN-OUT | OF STAGE | 1 AT | | • |
| 125.400 | 72,082 | 34,213 | 34034 400 | |
| a . | | 344513 | 14034.400 | 14,605 |
| 126 | | | • | |
| 126.000 | 73.410 | 34.562 | 14028.400 | 14,552 |
| 128.000 | 77.833 | 35.715 | 14009.200 | 14.376 |
| 130.000 | 82.252 | 36.852 | 13990.900 | 14.200 |
| 132.000 | 86.667. | 37.974 | 13973.500 | 14.200 |
| 134.000 | 91 • 079 | 39.081 | 13956.700 | 13.846 |
| 136.000 | 95•488 | 40.173 | 13940.600 | 13.668 |
| 138 • 000 | 99.894 | 41.250 | 13924.900 | 13.490 |
| 140.000 | 104.297 | 42.311 | 13909.700 | 13.312 |
| 142.000 | 108.697 | 43.358 | 13894.866 | 13 133 |
| 144.000 | 113.094 | 44.390 | 13880.300 | 12.954 |
| 146.000 | 117.489 | 45.407 | 13866.100 | 12.775 |
| 148.000 | 121.681 | 46.409 | 13852.144 | 12.595 |
| 150.000 | 126.270 | 47.395 | 13838.400 | 12.415 |
| 152.000 | 130.657 | 48.367 | 13824.956 | 12.235 |
| 154.000 | 135.041 | 49.324 | 13811.700 | 12.054 |
| 156.000 | 139.423 | 50.266 | 13798.700 | 11.873 |
| 166.000 176.000 | 161.299 | 54.752 | 13736.700 | 10.964 |
| 186.000 | 183.151 | 58 • 866 | 13679.906 | 10.047 |
| • D / | 204 • 893 | 62.608 | 13628-100 | 9.124 |
| 1-0-000 | 226.622 | 65•979 | 13581.431 | 8.194 |
| | | | | |

TABLE 27. (CONT'D)

| TIME | DANGE | | • | |
|---|---|------------------|---|--|
| FROM | RANGE | | | |
| LAUNCH | FROM | 41 70705 | | PATH |
| | LAUNCH | ALTTTUDE | VELOCITY | ANGLE |
| (SEC) | (NPI) | (HMI) | (FT/SEC) | (DEG) |
| 206.000 | 248-311 | 68.980 | 13539.800 | 7.260 |
| 216.000 | 269,965 | 71.611 | 13539.800 13503.300 13471.800 | 7.260 6.320 5.376 |
| 226,000 | 291,590 | 73,873 | 13471 800 | 5 376 |
| 236,000 | 313 188 | 75,765 | 13445 487 | 4.427 |
| 246,000 | 334,766 | 77.289 | 13424 300 | 3,477 |
| 256,000 | 356,327 | 78,445 | 13408 200 | 2,523 |
| 266,000 | 377 877 399 419 | 79 232 79 652 | 13397 200 | 1,568 |
| 276,000 | 399,419 | 79,652 | 13391 350 | 612 |
| 286,000 | 420,958 | 79,703 | 13390 600 | 345 |
| 296,000 | 442 499 | 79,387 | 13395 081 | _1_301 |
| 306,000 | 464 046 | 78,701 | 13404 600 | .2 25? |
| 316,000 | 485,603 | 77.648 | 13419 231 | -3,212 |
| 326,000 | 507,177 | 76,227 | 13439 100 13454 000 | -4 163 |
| 336,000 | 528,769 | 74,437 | 13454 000 | .1 301 .2 257 .3 212 .4 163 .5 111 |
| 346,000 | 550 386 | 72,278 | 13494 000 | -6.057 |
| 356,000 | 572,031 | 69,750 | 13529 106 | Z U02 |
| 366,000 | 593,710 | 66,852 | 13569 300 | -7 ,935 |
| 376,000 | 615,428 | 63,585 | 13614,531 | -8 665 |
| 386,000 | 637,187 | 59,946 | 13664 900 | -9.791 |
| 396,000 | 658,995 | 55,935 | 13569 300 13614 531 13664 900 13720 194 13789 500 | .10 709 |
| 406,000 | 680,854 | 51,553 | 13789 500 | _11 521 |
| 416.000 | 702,771 | 46,798 | 13845,606 13859,000 | _12_525 _12_705 |
| 418,000 | 707,161 | 45,802 | 13859 000 | _i2_705 |
| 420,000 | 711,554 | 44,791 | 13972 762 | _12_684 |
| 422,000 | 715,950 | 43,766 | 13886,500 | _12 684 _13 063 |
| 424,000 | 720 348 | 42,725 | 13900 481 | _13 242 _13 421 |
| 426,000 | 724,748 | 41,670 | 13914 200 | _13_421 |
| 428,000 | 729,151 | 40,600 | 13928,269 | _13_599 |
| 430,000 | 733,356 | 39,514 | 13941,900 | -13,//7 |
| 432,000 | 737,964 | 38,414 | 13955 894 | .13 954 |
| 434,000 | 742 374 | 37,299 | 13968,900 | _13_954 _14_132 |
| 436,000 | 740.786 | 36,169 | 13982 594 | -14,309 |
| 438.000 | 751,200 | 35,024 | 13994 500 | -14,485 |
| 440,000 | 755,617 | 33,864 | 14007 319 14017 000 | -14,661 |
| 442,000 | 760 033 | 32,690 | 14017 000 | _14_838 |
| 444,000 | 764,454 | 31,501 | 14027 906 | _15_013 |
| 442 000 444 000 446 000 448 000 450 000 452 000 454 000 456 000 458 000 | 760 033 764 454 768 871 773 292 777 708 782 123 786 534 790 938 795 332 | 36,538 | 14033 700 14041 367 | 14 838 15 013 15 189 15 365 15 540 |
| 448,000 | 773,292 | 29,079 | 14041,367 | 15,365 |
| 450,000 | 777.708 | 27,849 | 14040 100 | _15,540 |
| → 52,000 | 782,123 | 26,604 | 14436 900 | _40.140 |
| 454,000 | 780,534 | 25,347 | 14027 100 | 72,025 |
| 456,000 | 790,938 | 24.076 | 14008 000 | -10,008 |
| 458.000 | 795.332 | 22,795 | 13975.200 | _16,244 |
| | | | | |

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TABLE 27. (CONT'D)

| | ī | HDLE 2/. (C | ΛΥΤ ' D) | |
|---------------------------|--|-------------------------|--|-------------------------------|
| TIME | RANGE | | | |
| FROM | FROM | | | DATU |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | |
| 460.000 | 794.711 | 21.503 | 13922.800 | (DEG) |
| 462,000 | 804.067 | 20.204 | 13842,300 | -15-422 -16,661 |
| 464,000 | 808 389 | 18,901 | 13721 200 | _16_782 |
| 466,000 | 812,662 | 17,598 | 13542 000 | 16 067 |
| 468,000 | 808 389 812 662 816 863 820 965 | 16,302 | 13279 800 | _16 967 _17 157 |
| 479,000 | 820 965 | 15,023 | 12912,100 | 17,355 |
| 4/2,000 | 824 928 | 13,771 | 12411 600 | 17 564 |
| 474 000 | 828 707 | 13,771 12,562 | 11754°500 | 17 790 |
| 476 000 | 832 252 | 11,413 | 10930 900 | 18 038 |
| 478 000 | 835,511 | 11,413 10,339 | 9955 100 | 18,317 |
| 480,000 | 838,443 | 9,357 | 8872 300 | 18,637 |
| 482,000 | 832 252 835 511 838 443 841 924 | 8,475 | 7735 400 | 19 013 |
| 484 000 | 843,249 845,136 | 7,698 | 6622 900 | _19 460 |
| 486,000 | 845,136 | 7.020 | 5600 900 | 19 496 |
| 486 000 | 846 720 | 6,433 | 4702 100 | -20 642 |
| 490,000 | 848,040 | 5,925 | 3930 100 | 21,418 |
| 492,000 | 849 138 | 5 484 | 3292 300 | _22_350 |
| 494 000 | 850 054 | 5 097 4 754 | 2777 100 | _23 456 |
| 496.000 | 850.822 | 4 754 | 2355 400 | _24 757 |
| 498 000 | 851,468 | 4 445 4 165 3 908 | 2010_300 | _26 274 |
| 500,000 | 852,014 | 4,165 | 1732 500 1509 600 | 28,022 |
| 502 000 | 852.480 853.878 | 3,908 | 1509 600 | _30,006 |
| 504 000 | 852 878 | 3,007 | 1329 500 | 32 226 |
| 506,000 | 853,223 | 3,440 | 1185,400 | -34,669 |
| 508,000 | 853,523 | 3,222 | 1078,400 | -37_305 |
| 510,000 | 853,790 | 3.008 | 1008 800 | -40.061 |
| 512.000 514.000 | 854.033 854.356 | 2.793 | 963,100 | -42,858 |
| 516,000 | 854,256 854,463 | 2,576 | 932,400 | -45 .639 |
| 518,000 | 854,463 854 655 | 2,354 | 911 300 | _48 361 |
| 520,000 | 854,655 854,834 | 2,127 | 896 800 886 800 879 800 874 800 | _50 994 _53 518 _55 924 |
| 522.000 | 854,834 855,002 | 1 895 | 300 088 | -53 ,518 |
| 524,000 | 855,002 855,159 | 1,658 | 879,800 | _55,924 |
| 526.000 | 855,306 | 1,416 | 874.800 | -58,203 |
| 528,000° | 855.443 | 1,168 | 874 800 871 200 867 600 862 900 857 200 850 500 | -00,356 |
| 530.000 | 855,571 | .917 | 367,000 | -62 <u>-</u> 383 |
| 53 ,000 | 855,689 | .663 | 806.700 967.244 | -64,292 |
| 534,000 | 855,799 | .406 | 65/ £00 | -66 ,087 |
| 535,131 | 855.858 | .147 0.000 | 55V ₂ 50U | -67,776 |
| - - - - | | V • U U U | 846,177 | -68, 686 |
| | | | | |

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TABLE 28. TRAJECTORY T3N.50 (90)

| TIME | RANGE | | | |
|-----------------|-----------|----------|--|------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | UE: DOTTY | PATH |
| (SEC) | (NMI) | (NMI) | velocity (FT/SEC) | ANGLE |
| 0.000 | 0.000 | 0.000 | | (DEG) |
| 2.000 | 0.000 | .004 | 0,000 35 900 | 90.000 |
| 4.000 | 0,000 | 024 | 35,900 | 90.000 |
| 6 000 | 0.000 | A 4 3 | 85,000 135,800 | 90,000 |
| 8.000 | 0.000 | .114 | 188,300 | 90.000 |
| 10.000 | •005 | •185 | | 90.000 |
| 12.000 | •015 | •273 | 243.000 | 84.128 |
| 14.000 | •031 | •386 | 299.8 ₀₀ 358.9 ₀₀ | 82.554 |
| 16.000 | • 053 | •507 | 430 406 | 86.949 |
| 18.000 | • 082 | •653 | 420.400 | 79.329 |
| 20.000 | •121 | •818 | 484.0 <u>00</u> 550.600 | 77.706 |
| 22.000 | •170 | 1.004 | 613.300 | 76.091 |
| 24.000 | • 230 | 1.211 | 691.000 | 74.494 |
| 26.000 | •304 | 1.439 | 765.500 | 72.914 |
| 28.000 | •392 | 1.689 | 843,300 | 71.363 |
| 30.000 | • 496 | 1.961 | 924.000 | 69.843 |
| 32.000 | •617 | 2.254 | 1005.600 | 68.357 |
| 34.C00 | •756 | 2.569 | 1089.200 | 66.904 |
| 36.000 | •914 | 2.907 | 1174.500 | 65.488 |
| 38.000 | 1 • 0 9 3 | 3.265 | 1262-100 | 64.196 |
| 40.000 | 1 • 295 | 3.645 | 1352.400 | 62.758 |
| 42.000 | 1.519 | 4.047 | 1447.100 | 61.444 |
| 44-000 | 1.768 | 4.472 | 1544.960 | 60.166 |
| 4 5• 000 | 2+044 | 4.918 | 1647.300 | 58.922 57.717 |
| 48.000 | 2.347 | 5.388 | 1754.500 | 56.548 |
| 50.000 | 2+680 | 5+882 | 1866.800 | 55.418 |
| 52.000 | 3 • 044 | 6.400 | 1984.500 | 54.325 |
| 54.000 | 3 • 4 4 1 | 6.944 | 2108.300 | 53.155 |
| 56.000 | 3.876 | 7.511 | 2238.300 | 51.751 |
| 58.000 | 4 • 353 | 8.100 | 2374.700 | 50.171 |
| 60.000 | 4.876 | 8.711 | 2517.700 | 48,463 |
| 65-000 | 5.450 | 9.340 | 2667.700 | 46.663 |
| 64.000 | 6.079 | 9.987 | 2824.700 | 44.797 |
| 66.000 | 6.766 | 10.650 | 2989.000 | 42.884 |
| 68.000 | 7.517 | 11:326 | 3160.700 | 40.933 |
| 70.000 | 8.333 | 12.012 | 3340.000 | 38.951 |
| 72.000 | 9.221 | 12.707 | 3526.900 | 36.941 |
| 74.000 | 10.185 | 13.407 | 3721.500 | 34.905 |
| 76.000 | 11.822 | 14.108 | 3924.000 | 32.842 |
| 78.000 | 12.343 | 14.806 | 4134.200 | 30.752 |
| 80.000 | 13.549 | 15.498 | 4352.200 | 28.631 |
| 82.000 | 14.845 | 16.177 | 4578.000 | 26.478 |
| 84.000 | 16.232 | 16.840 | 4811.700 | 24.291 |

| | | TABLE 28. (| ርረህ አ ፈር ነ | |
|--|------------------------------|------------------|------------------------|------------------|
| TIME | RANGE | 22 20. (| (COMT.D) | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | NEL OCTOR | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 86.000 | 17.715 | 17.478 | ** ** 3=0/ | (DEG) |
| 88.000 90.000 | 19,296 | 18.087 | 3.7.4.44 | 22.070 |
| 90 000 92 000 | 20 978 | 18,659 | 5564 600 | 19,809 |
| 94 000 | 22 764 24 656 26 656 | 19,208 | 5867 800 | 17 637 |
| 96 000 | 24,056 | 19,758 | 6190 100 | 16 424 15 825 |
| 94 000 96 000 98 000 | 28.769 | 20,319 | 6190°100 6526°700 | 15,306 |
| 100-000 | 30.999 | 20:892 | 6878:300 | 14.816 |
| 102.000 | 33•350 | 21.477 | 7246.100 | 14.447 |
| 104.000 | 35 • 832 | 55.083 | 7632.9 ₀₀ | 14.017 |
| 106.000 | 38.447 | 22.694 | 8036 . 9nn | 13.602 |
| 108.000 | 41.205 | 23.324 | 8452.700 | 13.218 |
| 110.000 | 44.111 | 23¢970 24•630 | 8910.900 | 12.856 |
| 112.000 | 47-174 | 25.309 | 9384 • 000 | 12.517 |
| 114.000 | 50.506 | 26.006 | 9884.800 | 12•199 |
| 116.000 | 53.926 | 26.724 | 10416.400 10982.600 | 11.903 |
| 118.000 120.000 | 57.537 | 27.464 | 11587.700 | 11.627 |
| 122.000 | 61.350 | 28+229 | 12237.400 | 11.372 |
| 124.000 | 65.382 | 29•021 | 12938.400 | 11-137 |
| 32. 000 | 69.650 | 29.843 | 13699.000 | 10.921 |
| BURN-OUT | OF STAGE | l AT | | 10.724 |
| 125 | - 11102 | 1 AT | | |
| 125.400 | 72.771 | 30.436 | 14004 400 | |
| | | 000430 | 14006.400 | 10.597 |
| 126.000 | | | | |
| 120 000 | 74.118 | 30.690 | 14000.300 | 30 |
| 130 000 | 78,606 | 31,525 | 13980 200 | 10,543 |
| 130 000 132 000 134 000 | 83 0 <u>8</u> 9 | 31,525 32,345 | 13961 800 | 10,363 |
| 134 000 | 87 569 92 044 | 33 150 33 940 | 13944 900 | 10 183 10 002 |
| 136,000 | 96 516 | 33,940 | 13929 100 | 0 421 |
| 138 000 | 100 985 | 34,/14 | 13914 200 | 9 640 |
| 136 000 138 000 140 000 142 000 | 96.516 100.985 105.450 | 35,474 | 13900 300 13887 000 | 9 450 |
| 142,000 | 109,913 | 36 218 36 947 | 13887 000 | 9.276 9.093 |
| 144,000 | 114,374 | 37,662 | 13874 500 | 9 093 |
| 146.000 | 118,832 | 38,361 | 13862 500 13851 100 | 8,910 |
| 148.000 | 123.287 | 39.045 | 13840 300 | 8,727 |
| 150.000 152.000 | 127,741 | 39.714 | 13840,200 | 8,544 |
| 154.000 | 135,195 | 40.369 | 13829 700 13819 600 | 8.360 |
| 156 000 | 136,642 | 41.008 | 13840 044 | 8,177 |
| 158 000 | 141,089 | 41,633 | 13800 500 | 7,993 7,808 |
| 160,000 | 145 535 149 979 | 42,243 | 13791 400 | 7 24 |
| 156.000 158.000 160.000 162.000 | 154,421 | 42.837 | 13782 600 | 7 439 |
| 164.000 | 158,862 | 43,417 43,982 | 13774 100 | 7,254 |
| | , | 73,706 | 13765 944 | 7.069 |
| | | 114 | | - |

TABLE 28. (CONT'D)

| TIME | RANGE | | | |
|--|-----------|--|------------------------------------|--------------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITHDE | WE! 00754 | PATH |
| (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 166.000 | 153.301 | | (FT/SEC) | (DEG) |
| 168.000 | 167.739 | 45.068 | 13758.000 | 6.884 |
| 170,000 | 172,176 | 45,000 45 588 | 13750,319 | 6,698 |
| 172,000 | 176,611 | 45,588 | 13742 900 | 6,512 |
| 174 000 | 181,044 | 46.094 46.585 | 13735,712 | 6,326 |
| 176,000 | 185,477 | 47,061 | 13728 700 | 6,140 |
| 178 000 | 189 908 | 47 522 | 13721 981 | 5,954 |
| 180,000 | 194 338 | 47,522 47,968 | 13715 500 | 5,768 |
| 182 000 | 198 767 | 47,400 48 400 | 13709,206 | 5,581 |
| 184 000 | 203 194 | 40°916 | 13703 100 | 5 394 |
| 186 000 | 207,621 | 40,010 | 13697 231 | 5 207 |
| 188,000 | 212,047 | 48,400 48,816 49,218 49,605 49,977 | 13691 600 | 5,020 |
| 190,000 | 216,471 | 49 077 | 13686,156 | 4 833 |
| 192 000 | 220 895 | 50 335 | 13680 900 13675 881 | 4 646 |
| 168.000 170.000 172.000 174.000 176.000 178.000 180.000 182.000 184.000 186.000 188.000 190.000 192.000 202.000 | 243.001 | 51.899 | 13654.000 | 4,458 |
| 212.000 | 265 • 089 | | | 3,519 |
| 222-000 | 237 • 164 | 53•094 53•094 | 13637.256 | 2•578 |
| 232.000 | 309.232 | 53•918 54-274 | 13625.700 | 1.635 |
| 242.000 | 331 • 295 | 54°374 | 13619.250 | •691 |
| 252 • 000 | 353 • 359 | 54+458 | 13618-000 | *•254 |
| 262.000 | 375.430 | 54 • 174 | 13621-856 | *1.199 |
| 272.000 | 397.510 | 53+520 53+497 | 13630.800 | -2.142 |
| 282.000 | 419.506 | 52.497 | 13644.969 | -3.084 |
| 292.000 | 441.722 | 51•103 49•340 | 13664.100 | -4.025 |
| 294.000 | 446.148 | 48.943 | 13688.369 | -4.962 |
| 296•000 | 450 • 574 | 48.531 | 13693.800 | -5.150 |
| 298.000 | 455.002 | 48.104 | 13699.444 | -5.337 |
| 300.000 | 459.431 | 47.662 | 13705.300 13711.319 | -5.523 |
| 302.000 | 463.861 | 47.206 | | -5.7 10 |
| 304-000 | 468.292 | 46.735 | 13717.5 ₀₀ 13723.912 | -5.897 |
| 306.000 | 4720725 | 46.248 | 13730.500 | =6.083 |
| 308.000 | 477.159 | 45.747 | 13737.300 | -6.269 |
| 310.000 | 481.593 | 45.232 | 13744.200 | -6.455 |
| 312.000 | 486.029 | 44.701 | 13751.337 | -6.541 |
| 314.000 | 490•467 | 44.156 | 13758.600 | -6.827 |
| 316.000 | 494.905 | 43.595 | 13766.006 | •7•012 •7•199 |
| 318.000 | 499•345 | 43.020 | 13773.500 | -7.198 |
| 320•000 | 503•786 | 42•430 | 13781.187 | -7. 383 |
| 322•000 | 508.229 | 41 • 825 | 13788.900 | - 7∙568 -7∙753 |
| 324.000 | 512•673 | 41.205 | 13796.831 | -7.938 |
| 326,000 | 517,118 | 40.571 | 13804.700 | -8.122 |
| 328,000 | 521,565 | 39,922 | 13812,769 | -8.306 |
| 330,000 | 526,013 | 39,257 | 13820 700 | -8.490 |
| | = | — | | ■ ∪ • ₹₹0 |

TABLE 28. (CONT'D)

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Total Section 1

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| | TA | BLE 28. (CO | NT'D) | |
|---------------------|--|------------------|------------------------|-------------------------------|
| TIME | RANGE | (30 | , | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | ANGLE |
| 332.000 | 530 • 462 534 • 913 | 38•578 | | (DEG) |
| 334.000 | 534,913 | 37.885 | 13828.812 | -8.674 |
| 336,000 | | 37,176 | 13836,600 | -8,857 |
| 338,000 | 543 817 | 36,452 | 13844 606 13852 100 | -9.041 |
| 340.000 | 537, 365 543, 817 548, 271 552, 726 557, 182 561, 638 566, 096 570, 552 575, 010 579, 464 | 35,714 | 13859,750 | -9,224 |
| 342 000 344 000 | 552 726 | 34,961 | 13866 600 | -9 407 |
| 346 000 | 557 182 | 34 193 | 13873 675 | -9°590 -9°773 |
| 348 000 | 561,638 | 33,411 | 13879 400 | 9,955 |
| 348 000 | 566,096 | 32,614 | 13885 500 | 10 137 |
| 350.000 353.000 | 570,552 | 31,802 | 13889 ็5กอ | -10.320 |
| 352,000 | 575,010 | 30,976 | 13893 781 | 10,502 |
| 354.000 356.000 | 579,464 | 30,135 | 13895 100 | 10 684 |
| 356,000 358,000 | 583 921 588 372 | 29,279 | 13896 567 | -10,866 |
| 360,000 | 580,372 | 28,411 | 13893 600 | -11.049 |
| 362,000 | 592 ⁸ 22 | 27,527 | 13889 000 | _11_231 |
| 364 000 | 597°268 501°710 | 26,630 | 13880 900 | -11,413 |
| 366 000 | 506 145 | 25,719 | 13868 400 | -11 276 |
| 368 000 | 610 571 | 24,795 | 13850 100 | -11 779 |
| 370.000 | 614.986 | 23 858 | 13823 900 | 11 962 |
| 372-000 | 619.384 | 22.909 | 13787.500 | _11,779 _11,962 _12,146 |
| 374.000 | 623.763 | 21.949 | 13737.600 | *12•331 |
| 376.000 | 628-114 | 20.978 | 13670 • 000 | *12.518 |
| 378.000 | 632.430 | 19.999 | 13579 • 200 | - 12•707 |
| 38c + 000 | 636.698 | 19.012 | 13457.700 | -12.898 |
| 382•coo | 640.905 | 18.022 | 13296.200 | - 13•0 ⁹ 2 |
| 384.000 | 645.032 | 17•031 16•044 | 13082-400 | - 13•292 |
| 386. ₀₀₀ | 649.055 | 15.066 | 12803.200 | -13.497 |
| 388.000 | 652.949 | 14.104 | 12448.400 | -13.712 |
| 390.000 | 656.684 | 13•165 | 12005.400 11465.000 | -13.937 |
| 392.000 | 660•228 | 12.258 | 10623.400 | -14-177 |
| 394 • 000 | 663.550 | 11.391 | 10086.500 | *14.436 |
| 396 • 000 | 666.621 | 10.573 | 9270.800 | -14.720 -15.034 |
| 398.C00 | 069,419 | 9.810 | 8395.600 | - 15.388 |
| 400-000 | 671.932 | 9.108 | 7498.300 | -15.792 |
| 402.000 | 674.159 | 8.467 | 6618.400 | -16.255 |
| 404.000 406.000 | 676-110 | 7.887 | 5789.900 | -16.791 |
| 408-000 | 677.807 | 7.364 | 5033.200 | -17.413 |
| 408.000 | 679.274 | 6.894 | 4355•460 | -18.135 |
| 410.000 412.000 | 680.535 | 6.470 | 3757.000 | -18.976 |
| 414.000 | 681.617 | 6•088 | 3240.800 | -19.951 |
| 416 • 000 | 682.545 | 5.740 | 2801.300 | -21.079 |
| - 4 000 | 683•342 | 5•423 | 2429.200 | ~ 22•376 |
| | | | | - |

TABLE 28. (CONT'D)

| TIME | RANGE | | | |
|---------|---------|----------|----------|-------------------|
| FROM | FROM | | | 5.2 |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 418.000 | 684.027 | 5.130 | (FT/SEC) | (DEG) |
| 420,000 | 684,618 | | 2115.300 | -23.858 |
| 422,000 | 685 130 | 4.858 | 1850,600 | -25,538 |
| 424 000 | 685 575 | 4,603 | 1633 300 | _27,425 |
| 426 000 | 685 964 | 4,362 | 1451 800 | 29 519 |
| 428,000 | | 4,132 | 1301 800 | _31 817 |
| 430,000 | 686.305 | 3,909 | 1178,400 | _34_302 |
| 432,000 | 686 607 | 3,693 | 1082 400 | _36,950 |
| 432,000 | 686,877 | 3,480 | 1017 600 | _39 701 |
| 434,000 | 687,123 | 3,265 | 973 500 | -42,486 |
| 436,000 | 687,350 | 3,046 | 943 300 | _45_253 |
| 438,000 | 687.561 | 2,823 | 922,100 | -47,961 |
| 440,000 | 687.757 | 2 595 | 907 300 | 50 584 |
| 442.000 | 687,940 | 2,362 | 896 800 | 53,103 |
| 444.000 | 688,112 | 2,123 | 889 300 | 55 505 |
| 446,000 | 688,272 | 1,879 | 883 900 | . 57, 786 |
| 448,000 | 688,422 | 1,631 | 879 800 | -59,942 |
| 450,000 | 688,562 | 1,378 | 876 500 | -61 975 |
| 452,000 | 688,693 | 1,122 | 873 800 | .63.888 |
| 454.000 | 688,815 | 862 | 870.800 | -65,685 |
| 456,000 | 688,929 | .600 | 866,400 | -67.372 |
| 458,000 | 689 035 | .336 | 860 700 | |
| 400_000 | 689,133 | 071 | 853,700 | _68 957 |
| 460.533 | 689.157 | 0.000 | 851.567 | -70 446 70 H20 |
| | | 0.000 | 9319381 | -70.828 |

TIME RANGE FROM FROM PATH LAUNCH LAUNCH ALTITUDE VELOCITY ANGLE (SEC) (NMI) (NMI) (FT/SEC) (DEG) 0.000 0.000 0.000 0.000 90.000 2.000 0.000 .004 35,900 90.000 90 000 90 000 90 000 84 128 82 554 4.000 0.000 .024 85 000 6.000 8.0 135 800 0.000 ,061 . C00 188 300 .114 0.000 .005 243 000 10,000 .185 299 800 .015 12,000 .273 80.949 .380 358,900 14.000 .031 16.000 .053 79.329 •507 420-400 18-000 484.000 77.706 .082 •653 20.000 76 • 091 •121 +818 550.600 22.000 ·170 1.004 619.300 74.494 24.000 .230 72.914 691.000 1.511 765.600 26.000 1.439 ·3n4 71:363 28.000 .392 1 . 689 843.300 69.843 •496 1.961 30.000 924.000 68.357 2.254 •617 1005.600 56.904 2.569 1089-200 •756 65.488 2.907 .914 1174.500 64-106 1.093 3.265 1262-100 62.758 1.295 1352.400 61.444 3.645 1.519 1447.100 60.166 4.047 58.422 1.768 4.472 1544.900 57.717 2.044 4.918 1647.300 2.347 5.388 1754.500 56.548 2.680 5.882 1866.800 55.418 1984.500 3.044 6.400 54.325

TRAJECTORY T3N.50 (95)

TABLE 29.

Contraction of the second

THE OTHER WATER PROPERTY OF THE PROPERTY OF TH

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32.000 34.000 36 • 000 38.000 40.000 42.000 44-000 46.000 48.000 50.000 52.000 54.000 3.441 6.944 2108.300 53.155 56.000 3.876 7.511 2238.300 51.751 58.000 8-100 4.353 2374.700 50 • 171 60.000 4.876 8.711 2517.700 48.463 62.000 2667.700 5.450 9.340 46.663 64.000 9.987 6.079 2824.700 44.797 66.000 2989.000 6.766 10.650 42.884 68.000 7.517 11.326 3160.700 40.933 70.000 8.333 3340.000 12.012 38.951 72.000 9.221 12.707 3526.900 36.941 74.000 34.905 10.182 13.407 3721.500 76.000 11.222 14.108 3924.000 32.842 78.000 4134.200 30.752 12.343 14.806 80.000 4352.200 13.549 15.498 28.631 82.000 14.645 16-177 4578.000 26.478 84.000 16.232 16.840 4811.700 24.291

| | | TABLE 29. (CC | ONT'D) | |
|-------------------------------|--------------------|-------------------|------------------------|----------------|
| TIME | RANGE | , | • | |
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 86.000 | 17.715 | 17.478 | 5053.200 | 22.070 |
| 88,000 | 19.296 | 18.087 | 5302,500 | 19.809 |
| 90,000 | 20 978 | 18,659 | 5559 800 | 17,513 |
| 92,000 | 22,763 | 19,186 | 5825°700 | 15,187 |
| 94,000 | 24,653 | 19,661 | 5825 700 6101 400 | 12,844 |
| 96,000 | 26,651 | 20,080 | 6405 300 | 10,810 |
| 98,000 | 28,764 | 20,458 | 6405 300 6748 400 | 9,414 |
| 100,000 | 30,999 | 20,814 | 7120 000 | 8 661 |
| 102,000 | 33,360 | 21,167 | 7511 300 | 8,208 |
| 104,000 | 35 853 | 21,520 | 7921 300 | 1 102 |
| 106,000 | 38 483 | 21 870 | 8353 000 | 7 552 |
| 108,000 | 41,256 | 22,242 | 8805 400 | 7 188 |
| 110,000 | 44 181 | 22,596 | 9282 400 | 6 829 |
| 112.000 | 47.266 | 22.962 | 9786,500 | 6 829 6 503 |
| 114.000 | 50 • 620 | 23•329 | 10321.000 | 6.,38 |
| 116.000 | 54.067 | 23.696 | 10889.500 | 5.914 |
| 118-000 | 57.706 | 24.067 | 11496•400 | 5.651 |
| 120.000 | 61.551 | 24.442 | 12147.200 | 5.409 |
| 122.000 | 65.617 | 24.822 | 12848.400 | 5.187 |
| 124.000 | 69.920 | 25.207 | 13608.400 | 4.985 |
| | | 20.20 | 1300-0.00 | 407-3 |
| BURN-OUT | OF STAGE | 1 AT | | |
| | | | | |
| 125.400 | 73.068 | 25.480 | 13914.800 | 4.854 |
| | | | | |
| 126 000 | 74 407 | 25 504 | 10005 000 | |
| 126.000 | 74.427 | 25.596 | 13905.200 | 4.798 |
| 128.000 | 78,949 | 25.971 | 13872,400 | 4,613 |
| 130.000 | 83,462 | 26,330 | 13842,200 | 4,427 |
| 132.000 | 87.966 | 26,674 | 13814,300 | 4,240 |
| 134.000 | 92,462 | 27.002 | 13788,300 | 4,052 |
| 136.000 | 96,950 | 27,315 27,613 | 13764,100 | 3,664 |
| 138.000 | 101,431 | 27,613 27,005 | 13741,500 | 3,675 |
| 140.000 | 105,906 | 27 ⁸⁹⁵ | 13720 400 | 3,486 |
| 144.000 | 110.375 114.837 | 28,162 | 13700 500 13681 800 | 3 296 3 106 |
| 146.000 | 119, 295 | 28,414 28,450 | | 3 106 |
| 148 000 | 123,747 | 28,650 28,872 | 13664 200 13647 400 | 2 915 2 724 |
| 150 000 | 128 194 | 28 872 29 077 | 13631 600 | 2 533 |
| 152 000 | 132,637 | 29 268 | 13616 500 | 2 341 |
| 150 000 152 000 154 000 | 137,076 | 29,444 | 13616 500 13602 100 | 2 148 |
| 156,000 | 141,510 | 29,604 | 13588 400 | 1,956 |
| 158,000 | 145,940 | 29.749 | 13575 300 | 1,763 |
| 160.000 | 150,366 | 29.879 | 13562 800 | 1.570 |
| 162,000 | 154.788 | 29,993 | 13550 700 | 1.376 |
| 164.000 | 159,207 | 30.093 | 13539,200 | 1.182 |
| • • | | • • • | 0 | · · |
| | | | | |

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TABLE 29. (CONT'D)

| TIME | RANGE | | | |
|--|--------------------|--------------------------------------|--|------------------|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | 14 5 1 0 - 1 - 1 | PATH |
| (SEC) | (NMI) | | AEFOCITA | ANGLE |
| 166.000 | 163.622 | (MMI) | (FT/SEC) | (DEG) |
| 168,000 | 168.034 | 30.177 | 13528.000 | • 488 |
| 170,000 | 172,443 | 30.246 | 13517.300 | .793 |
| 172,000 | 176 848 | 30,300 | 13506,900 | 598 |
| 174.000 | 181,250 | 30,339 | 13496 900 | 403 |
| 1 (0,000 | 185 649 | 30,363 | 13487 100 | 208 |
| 110,000 | 185 649 190 045 | 30,372 | 13477 600 | 013 |
| 100,000 | 194 438 | 30 365 30 343 | 13468 400 | _ 183 |
| 182 000 | 198 828 | 30 343 | 13459 300 | 379 |
| 184,000 | 203,215 | 30,306 | 13450 400 | 575 |
| 186,000 | 207.599 | 30.254 | 13441,700 | - 772 |
| 188,000 | 211,980 | 30,187 | 13433 000 | -,968 |
| 120,000 | 216 358 | 30,105 | 13424 400 | -1,165 |
| 192 000 | 220 733 | 30,008 | 13415 900 | _1_362 |
| 194 000 | 225 165 | 29 895 29 767 | 13407 400 | -1,560 |
| 196,000 | 229 474 | 20 425 | 13398 800 | _1 757 |
| 198,000 | 233 840 | 29,023 | 13390 100 | -1, 955 |
| 200 000 | 238 2N2 | 20 204 | 13381 300 | -2 153 |
| 202,000 | 242,561 | 29.625 29.467 29.294 29.105 | 13372 400 | _2_351 |
| 194,000 196,000 198,000 200,000 202,000 204,000 206,000 208,000 | 246 917 | 28,902 | 13363 200 | _2 549 |
| 206,000 | 521 563 | 28 684 | 13353 8 ₀₀ 13344 000 | _2 748 |
| 208 000 | 255 618 259 962 | 28 451 | 13333 800 | 2 947 |
| 208 000 210 000 212 000 214 000 216 000 218 000 220 000 222 000 | 259 962 | 58 505 | 13323 100 | _3 146 |
| 212,000 | 264 302 | 27,939 | 13311 900 | .3 346 .3 545 |
| 214.000 | 268 638 | 27,660 | | -3,545 |
| 216,000 | 274,969 | 27,367 | 13299 900 13287 100 | -3,745 |
| 218,000 | 277, 296 | 27,059 | | _3,945 |
| 220,000 | 281 617 | 26,735 | | -4.146 |
| 222,000 | 285 932 | 26,397 | 13258 600 13242 500 | -4,347 |
| 224,000 | 290 241 | 26.044 | 13225 000 | -4,548 |
| 224 000 226 000 228 000 | 294,543 | 25,676 | 13205 800 | -4 750 |
| 228,000 | 298,837 | 25, 293 | 13205 800 13184 700 13161 200 | 4 953 |
| 230,000 | 303,124 307,401 | 24,896 | 13161 200 | -5 155 -5 359 |
| 232,000 | 307,401 | 24,484 | 13135 000 | =5,359 5,543 |
| 234.000 | 311,669 | 24,058 | 13105 500 | -5,563 |
| 236,000 | 315,925 | 23,617 | 13072 300 | -5,767 5,973 |
| 238 000 | 350,169 | 23,162 | 13034 700 | -5,973 |
| 240,000 | 320,169 324,399 | 22,694 | 12992 000 | -6.179 -6.387 |
| 242,000 | 328_613 | 22,211 | 13181 200 13135 000 13105 500 13072 300 13034 700 12992 000 12943 300 12887 700 | -6.387 6.596 |
| 244,000 | 332,808 | 21,715 | 12887 700 | -6,596 6,806 |
| 246,000 248,000 250,000 | 330,983 | 21,206 | 12823 900 12750 500 12665 800 | -6 806 |
| 248,000 | 341,135 | 20,684 | 12750 500 | -7.018 7.231 |
| 250,000 | 345,260 | 20,149 | 12665 800 | -7 231 7 447 |
| | • | • • | | _7,447 |

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TABLE 29. (CONT'D)

| | - | | 214T . D.) | |
|--------------------|---|----------|--|---|
| TIME | RANGE | · | . , | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | A1 | | PATH |
| (SEC) | /MM+1 | ALTITUDE | VELOCITY | ANGLE |
| 252.000 | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 254 000 | 3 ₄ 9.3 ₅ 3 | 19.603 | 12247-900 | |
| 254.000 | 353,411 | 19.046 | 12567.900 12454.500 | ~ 7.655 |
| 256 000 | 357,428 | 18 479 | 12323 000 | -7,886 |
| 258 000 | 361 397 | 17,902 | 12170 400 | -8,111 |
| 262.000 260.000 | 357 428 361 397 365 312 | 17,317 | 12110 400 | _8 340 |
| 262,000 | 369 162 | 16 778 | 11992 900 | -8 573 |
| 264,000 | 372,939 | 16,725 | 11/80 500 | -8 813 |
| 266,000 | 376 633 | 16,129 | 11247 000 | - 9 059 |
| 268,000 | 376,632 | 15,529 | 11279,900 | -9,313 |
| 270 000 | 380.230 | 14,928 | 10974 300 | -9.577 |
| 270 000 272 000 | 383,721 | 14,328 | 10630 700 | _9°H52 |
| 274 000 | 301.042 | 13,731 | 10630 700 10247 800 | 9`853 |
| 274 000 276 000 | 277, 231 | 13,141 | 9825 900 | -10.142 |
| 276,000 | 373 627 | 12,559 | 9364 900 | -10,446 |
| 278 000 | 396 361 | 11,990 | | _10,770 |
| 280,000 | 399 129 | 11,435 | 9333 300 | -11 112 |
| 282,000 | 401.717 | 10 999 | 7774 100 | _11.487 |
| 284,000 | 404 121 | 10,898 | 7776,100 | -11,888 |
| 286,000 | 396 361 399 129 401 717 404 121 406 337 | 10,381 | 8865 500 8333 200 7776 100 7204 900 6632 200 6069 300 5525 900 5007 700 4520 000 4063 700 | -12,328 |
| 288 000 | 400,331 | 9,886 | 6632,200 | -12,808 |
| 290,000 | 100,301 | 9,413 | 6069 300 | -13,337 |
| 292 000 | 410,216 | 8,964 | 5525 900 | -13,922 |
| 292.000 | 411,891 | 8,538 | 5007,700 | _14,570 |
| 294.000 | 413,402 | 8,135 | 4520 000 | -15 290 |
| 296.000 | 414.758 | 7.753 | 4063.700 | -15.290 -16.092 |
| 298.000 | 415.971 | 7.393 | 3643. ⁹ 00 | -16.032 |
| 300.000 | 417.052 | 7.052 | 3263.000 | -16.987 |
| 302.000 | 418-014 | 6.729 | 3203.000 | -17.984 |
| 304.000 | 418.868 | | 2919.800 | -19.097 |
| 306.000 | 419.626 | 6.422 | 2610.900 | -20.336 |
| 308,000 | 420 296 | 6.131 | 2332.900 | -21.713 |
| 310,000 | 420 808 | 5,854 | 2082,200 | . 23,242 |
| 312,000 | 420,888 | 5,589 | 1866,900 | -24,934 |
| 314,000 | 421,412 | 5 335 | 2085,200 1866,900 1680,100 | _26 794 |
| | 421,876 | 5,090 | 1610 744 | 58 855 |
| 316,000 | 422,289 | 4,852 | 1380,900 1262,800 1162,500 1081,600 | -31,017 |
| 318,000 | 422,656 | 4,621 | 1262 800 | 33,380 |
| 320,000 | 422,984 | 4,395 | 1162 500 | _33 369 |
| 322 000 324 000 | 423 278 | 4,172 | 1081 600 | _35 863 |
| 324.000 | 423 543 | 3,951 | 1024.400 | -30 475 |
| 326,000 | 423,786 | 3,728 | 984 100 | -41 ₋₁₂₈ |
| 320,000 | 422,656 422,984 423,278 423,543 423,786 424,011 424,219 | 3 801 | 984 100 | _38 475 _41 158 _43 857 _46 529 _49 139 |
| 330,000 | 424,219 | 3,501 | 955 500 | - 46,529 |
| 332,000 | 424.414 | 3,271 | 935,100 | -49,139 |
| 334.000 | 1640474 | 3.036 | 920,400 | 27,004 |
| 336,000 | 424.595 424.745 | 2,796 | 908,600 | -54 089 |
| ,000 | 424,765 | 2,551 | 901,600 | -56 403 |
| | | | - | . |

TABLE 29. (CONT'D)

| TIME FROM Launch | RANGE From Launch | ALTITUDE | WEL DOITE | PATH |
|--|---|---|---|---|
| (SEC) 338.000 340.000 342.000 344.000 346.000 350.000 352.000 354.000 355.407 | (NMI) 424.924 425.072 425.211 425.340 425.461 425.574 425.679 425.776 425.867 425.926 | (NMI) 2.301 2.048 1.790 1.529 1.265 999 .731 .461 | VELOCITY (F?/SEC; 895:500 890:800 886:800 883:400 880:300 877:300 874:000 869:100 862:600 | ANGLE (DEG) -58.601 -60.682 .62.646 .64.495 .66.234 .67.866 .69.397 .70.833 .72.181 |
| • | +631120 | 0.000 | 857,170 | -73.081 |

TABLE 30. TRAJECTORY T3N.50 (100)

| TIME | RANGE | | | |
|------------------|----------------|-------------------|--|--|
| FROM | FROM | | | PATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 0,000 | 0.000 | 0.000 | 0.000 | 90.000 |
| 2.000 | 0.000 | .004 | 35.911 | 90.000 |
| 4.000 | 0.000 | .024 | 85 000 | 90,000 |
| 6,000 | 0.000 | .061 | 135 800 | 90.000 |
| 8,000 | 0,000 | 114 | 188 300 | 90,000 |
| 10,000 | 005 | 114 185 | 85,000 135,800 188,300 243,000 299,800 | 84,128 |
| 12,000 | .015 | 273 | 299 800 | 82,554 |
| 14,000 | .031 | 380 | 358,900 | 80,949 |
| 16,000 | 053 | 507 | A70 800 | 79 329 |
| 18,000 | .082 | 653 | 484 000 | 77.706 |
| 20.000 | .121 | 818 | 484 000 550 600 | 76,091 |
| 55,000 | .170 | 1,004 | 619,300 | 74,494 |
| 24,000 | 230 | 1,211 | 071 VIII | 72 914 |
| 26,000 | 304 | 1,439 | 765 [*] 600 | 71 363 |
| 58 000 | 392 | 1,689 | 843 [°] 300 924 [°] 000 | 69 843 |
| 30,000 | .496 | 1,961 | 924 000 | 68 357 |
| 32,000 | 617 | 2,254 | 1005~600 | 66 904 |
| 34.000 | .756 | 2,56 9 | 1089 200 | 65,488 |
| 36,000 | .914 | 2.907 | 1174,500 | 64,106 |
| 38,000 | 1.093 | 3,265 | 1262,100 | 62,758 |
| 40,000 | 1,295 | 3,645 | 1352,400 | 61,444 |
| 42.000 | 1.519 | 4,047 | 1089 200 1174 500 1262 100 1352 400 1447 100 1544 900 1647 300 | 60,166 |
| 44.000 | 1.768 | 4,472 | 1544,900 | 58,922 |
| 45,000 | 2.044 | 4 918 | 1647 300 | 57,717 |
| 48,000 | 2,347 | 5.388 | 1/59 200 | 56,548 |
| 50,000 | 2,680 | 5,882 | 1866 800 | 55,418 |
| 52.000 54.000 | 3.044 | 6.400 | 1984 500 2108 300 2238 300 2374 700 | 57 (17 56 548 55 418 54 325 53 155 51 751 50 171 |
| 54,000 | 3,441 | 6,944 | 2108,300 | 53,155 |
| 56,000 58,000 | 3,876 | 7,511 | 2238,300 | 51,751 |
| 58,000 60,000 | 4.353 4.876 | 8,100 | 25/4,/00 | 50.171 |
| 62,000 | 5.450 | 8,711 | 2517.700 2667.700 2824.700 | 40,403 |
| 64.000 | 6.079 | 9.340 | 2001,100 | 46,663 |
| 66,000 | | 9,987 | 2009 100 | 44 797 |
| 68,000 | 6.766 7.517 | 10,650 | 2989 000 | 40 004 |
| 70.000 | 8.333 | 11,326 | 3160,700 3340,000 3526,900 | 70,733 |
| 72.000 | 9,221 | 12.012 | 3526 900 | 36 441 |
| 74.000 | 10 182 | 12,707 13,407 | 3721,500 | 42 884 40 933 38 951 36 941 34 905 32 842 30 752 28 631 26 478 |
| 76 000 | 11,222 | 14,108 | 3924 000 | 32,442 |
| 78 000 | 12,343 | 14,806 | 4134 2nn | 30 752 |
| 80.000 | 13,549 | 15,498 | 4352,200 | 28 631 |
| 82,000 | 14,845 | 16,177 | 4578,000 | 26,478 |
| 84.000 | 16,232 | 16,840 | 4811.700 | 24,291 |
| | • | • | | |

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| ** | | | | | |
|--|---|---|------------------|---|------------------|
| _ | TIME | RANGE | | | |
| 7 | FROM | FROM | | | |
| 4 | LAUNCH | LAUNCH | ALTITUDE | VEL CATTY | PATH |
| | (SEC) | (NMI) | (NMI) | VELOCITY | ANGLE |
| 7 | 86.000 | 17.715 | | 'FT/SEC) | (DEG) |
| 1 | 88.000 | 19.296 | 17.478 | 5053.200 | 22.070 |
| 188 | 90.000 | 7,978 | 18.087 | 5302,500 | 19,809 |
| ⇒ p | 92 000 | _2.763 | 18,659 | 5559,800 | 17,513 |
| | 94,000 | 24,653 | 19.186 | 5559 800 5825 700 6101 400 6388 200 | 15 187 12 844 |
| ** | 96 000 | 26 650 | 19,661 | 6101,400 | 12 844 |
| | 94 000 96 000 98 000 100 000 102 000 104 000 | 28,756 | 20,076 | 6388 200 | 10,200 |
| wa už | 100 000 | 30 973 | 20,425 20,700 | 6688 300 | 8,172 |
| Adena | 102,000 | 33 312 | 20,700 | 7009 700 | 5 974 |
| ~ | 104 000 | 35,782 | 20,915 | 7387 500 | 4 566 |
| 77 | 106,000 | 38 391 | 21.095 | 7798 700 | 3 802 |
| Statement of the statem | 108,000 | 41 145 | 21,260 | 8232 700 | 3 390 |
| 44 | 106 000 108 000 110 000 | 44,051 | 21,415 | 8688 600 9170 400 | 3 006 |
| | 112,000 | 47,119 | 21,555 | 9170,400 | 2 822 |
| the can | 112 000 114 000 | 50 454 | 21,710 | 70/0 / !!!! | 2 501 |
| <u> </u> | 116,000 | 50 456 53 887 | 21.834 | 10212 800 | 2 181 |
| | 118_000 | 57 500 | 21,959 | 10781 900 11388 400 | 1 892 |
| 73 | 120 000 | 61 338 | 22.071 | 11388,400 | 1,625 |
| Total Control of the | 122,000 | 57,509 61,338 65,386 69,671 | 22,172 | 12037 200 12734 900 | 1,378 |
| ≅ -# | 124,000 | 69 671 | 22,262 | 12/34 900 | 1,151 |
| ••• | • • • • • | 0,011 | 22,340 | 13488 900 | 945 |
| - Lander | BURN-OU | T OF STAGE | 1 AT | | · |
| -1 | | | • ~! | | |
| | 125.400 | 72.805 | 22.389 | 12700 744 | |
| Description of the second of t | | | £2 • 30 7 | 13789.700 | .811 |
| 11 | | | | | |
| | 126.000 | 74.157 | 22.407 | 13771 000 | |
| 71 | 128.000 | 78,650 | 22.459 | 13771.800 | • /54 |
| Person | 130,000 | 83,123 | | 13708.200 | .564 |
| 46 | 132 000 | 83,123 87,575 | 22,496 22,518 | 13646 100 13585 200 | .372 |
| | 134,000 | 92.008 | 22.524 | 13505 200 | 179 |
| Comment | 136 onn | D6 431 | 22 515 | 13525 300 13466 100 | 015 |
| 20 | 138 000 | 100.815 | 22,515 | 13400 100 | - 212 |
| | 144,000 | 100.815 105.190 109.546 113.882 118.199 122.496 126.773 | 22,491 22,452 | 13407 446 13348 900 13290 460 13231 70 J | 409 |
| 7.8 | 142,000 | 109.546 | 22,398 | 13340,400 | - 609 |
| | 144,000 | 113 882 | 22,320 | 13270,767 | - 009 |
| | 140,000 | 118 199 | 22,329 | 13531 (0) | -1.012 |
| ~ | 140.000 | 122,496 | 22,244 | 13172 600 13112 700 | -1,216 |
| | 120,000 | 126 773 | 22,145 | 13112,700 | -1,421 |
| • | 152,000 | 131.030 | 22.030 | 13051 800 | -1,628 |
| | 154.000 | 135 266 | 21,901 | 12989 800 | -1,836 |
| 7 | 156,000 | 135,266 139,481 | 21.756 | 12926 200 | -2.047 |
| 1 | 158.000 | 143.673 | 21.597 | 15860 800 | -2,259 |
| | 160.000 | 147.843 | 21.423 | 12/93.300 | -2.473 |
| 4 | 162.000 | 151.988 | 21 • 233 | 12723.200 | -2.689 |
| 1 | 154.000 | 121.740 | 21.030 | 12650 • 300 | -2.906 |
| ₩ | • • • • • • • • | 156-109 | 50.811 | 12574-100 | -3.126 |
| | | | 124 | | |

TABLE 30. (CONT'D)

| TIME | RANGE | | | |
|--|--|----------------|--|---|
| FROM | FROM | | | |
| LAUNCH | LAUNCH | AL TETUOR | | PATH |
| (SEC) | | ALTITUDE | VELOCITY | ANGLE |
| | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 166.000 | 160.203 | 20.578 | 12494.100 | |
| 168.000 | 164.271 | 20.331 | 12409.800 | -3.573 |
| 1/0,000 | 168_309 | 50,069 | 12320 600 | 3 700 |
| 172,000 | 172 316 | 19,794 | 15556,000 | -3,799 |
| 174,000 | 168,309 172,316 176,291 | 10 504 | 15556 000 | - 4_029 |
| 170,000 172,000 174,000 176,000 | 100 221 | 19,504 | 12125°200 12017°400 | • • • • • • • • • • • • • • • • • • • |
| 178 000 | 180,231 | 19,200 | 12017_400 | -4,497 |
| 178 000 180 000 | 184 133 | 18,884 | 11901,700 | -4,736 |
| 100,000 | | 18,554 | 11901 700 11777 300 11642 900 11497 600 | -4.979 |
| 182,000 | 191,815 | 18,211 | 11642 900 | _% 22E |
| 184,000 | 195,587 | 17,856 | 11497 600 | -5,225 |
| 186,000 | 199,309 | 17,489 | 11339,700 | -5,477 |
| 188,000 | 202 976 | 17,110 | 11337,700 | -5 /33 |
| 190,000 | 206 582 | 14 721 | 11166 600 | -3,774 |
| 192,000 | 210 124 | 16,721 | 10979 600 | -6.262 |
| 194.000 | 212 504 | 16,322 | 10777 300 | -6,537 |
| 196,000 | 213,396 | 15,914 | 10558 800 | -6 819 |
| 198 000 | 510,995 | 15,497 | 10323,000 | -7 110 |
| 198,000 | 220,307 | 15,073 | 10068 900 | -7 410 |
| 500.000 | 191 815 195 587 199 309 202 976 206 582 210 124 213 596 216 992 220 307 223 535 | 14,643 | 9795 800 | -6 537 -6 819 -7 110 -7 410 -7 721 |
| 505.000 | 226.668 229.701 232.625 235.434 238.122 240.682 243.109 | 14,207 | 9501 900 | B 044 |
| 204.000 | 229,701 | 13,766 | 9186,400 | -8 044 -3 381 -8 734 |
| 506.000 | 232,625 | 13,326 | 8849 400 | -0.361 |
| 508,000 | 235 434 | 12 984 | 049,400 | -8 , 734 |
| 210.000 | 238 122 | 12,884 | 8491,500 8114,300 7719,900 | -9 104 -9 494 -9 907 -10 347 |
| 212,000 | 240 402 | 12,442 | 8114,300 | -9,494 |
| 214.000 | 243,100 | 12,003 | 7719,900 | -9,907 |
| 216 000 | 243,109 | 11,568 | 7311,400 | -10,347 |
| 216.000 | 245,400 | 11,139 | 6892,500 | _1C_816 |
| 218,000 | 247,551 | 10,717 | 6467 700 | -11 318 |
| 220,000 | 249.562 | 10,304 | 6042 600 | 11 450 |
| 555,000 | 251,433 | 9,900 | 5622 400 | 12 443 |
| 224.000 | 245 400 247 551 249 562 251 433 253 167 254 767 | 9.507 | | -10.816 -11.318 -11.859 -12.443 -13.074 -13.760 -14.507 |
| 226,000 | 254.767 | 9.124 | 5210 300 | -13,074 |
| 228,000 | 256,236 | 9 754 | 4810,400 | -13,760 |
| 230,000 | 257,581 | 8,754 | 4424,100 | -14,507 |
| 232,000 | 250 044 | 8,395 | 4054,100 | -12 ² 251 |
| 234,000 | 250,000 | 8.048 | 3704,100 | -16,212 |
| 236 000 | 227,717 | 7.714 | 3376 900 | _16 212 _17 188 |
| 236 000 | 200,928 | 7,391 | 3704 100 3376 900 3073 300 | 18 257 |
| 238 000 | 261,839 | 7,080 | 2793 400 | _19~428 |
| 240,000 | 258 806 259 919 260 928 261 839 262 661 | 7,080 6,780 | 2534 200 | .,20,711 |
| 242 _000 | 203,377 | 6.490 | 2296 200 | 22 114 |
| 244 _000 | 264,061 | 6.210 | 2079 100 | -22,116 |
| 246,000 | 264,652 | 5.941 | 1881 800 | -23 655 |
| 248,000 | 265,181 | 5,680 | 1881,800 | -25,336 |
| 250,000 | 265,653 | | 1707.900 | -27.166 |
| • • • | | 5,427 | 1556 800 | -29 147 |

TABLE 30. (CONT'D)

| TIME FROM LAUNCH (SEC) 252.000 254.000 256.000 260.000 262.000 264.000 264.000 268.000 268.000 | RANGE FROM LAUNCH NMI) 266.076 266.455 266.794 267.099 267.374 267.624 267.855 266.69 268.267 268.453 | ALTITUDE (NMI) 5.180 4.940 4.704 4.473 4.244 4.015 3.785 3.550 3.312 3.070 | VELOCITY (FT/SEC) 1423.200 1307.400 1207.600 1122.300 1056.700 1009.700 976.100 952.000 934.400 921.400 | PATH ANGLE (DLG) -31.275 -33.545 .35.945 .38.458 .41.053 .43.682 .46.300 .48.872 .51.371 |
|--|--|---|--|---|
| 272.000 274.000 276.000 278.000 280.000 282.000 284.000 286.000 288.000 290.000 292.000 293.311 | 268.626 268.788 268.939 269.080 269.212 269.335 269.450 269.557 269.657 269.749 269.835 269.887 | 2.53 2.572 2.317 2.058 1.796 1.531 1.264 994 .723 .451 .178 0.000 | 911.700 904.300 898.400 893.700 889.600 885.900 882.500 879.200 875.900 871.000 864.400 859.256 | -56.082 -58.276 -60.358 -62.326 -64.182 -65.929 -67.571 -69.12 -71.912 -73.184 -73.976 |

TABLE 31. TRAJECTORY T3N.50 (105)

| | | | 101,100 (100) | |
|--------------------------------------|---------------------------|--|----------------------|--|
| TIME | RANGE | | | |
| FR04 | FROM | | | DATH |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | | | ANGLE |
| 0.000 | | (NMI) | (FT/SEC) | (DEG) |
| 2.000 | 0.000 | 0.000 | 0.000 | 90.000 |
| | 0.000 | •004 | 35.900 | 90.000 |
| 4.000 | 0,000 | .024 | 85,000 | 90,000 |
| 6.000 | 0.000 | .061 | 135,800 | 90 000 |
| 8 000 | 0,060 | ,114 | 188 300 | 90,000 |
| 10,000 | .005 | · · · · · · · · · · · · · · · · · · · | 243 000 | 84 128 |
| 15,000 | .015 | .27. | 299 800 | 82,554 |
| 14,000 | .031 | .380 | 358 900 | 80,949 |
| 16,000 | 053 | 507 | 420 400 | 79,329 |
| 18,000 | 082 | 653 | 194 000 | 77.106 |
| 20,000 | ,121 | 818 | 550 000 | |
| 16 000 18 000 20 000 22 000 | .170 | 1,004 | | 76 091 74 494 |
| 24 000 | 230 | 1,211 | 619 300 | |
| 26 000 | 304 | 1 6 2 2 2 | 691 000 765 6ng | 72,914 |
| 28 850 | 392 | 1,439 | | 71 363 |
| 30 000 | 496 | 1.689 | 843 300 | 69 843 |
| 28 000 30 000 32 000 | 617 | 1,961 | 924 000 | 68 357 |
| 36 000 | | 2 254 | 1005 600 | 66,804 |
| 34,000 | .756 | 2,509 | 1089,200 | 65,488 |
| 36,000 | .914 | 2,907 | 1174,500 | 64,106 |
| 38,000 | 1.093 | 3,265 | 1262,100 | 62,758 |
| 40.000 | 1,295 | 3,645 | 1352,400 | 61,444 |
| 42,000 | 1,519 | 4.047 | 1447 100 | 60 165 |
| 44,000 | 1.768 | 4,472 | 1544 900 | 58, 422 |
| 46,000 | 2.044 | 4,918 | 1647 300 | 57°717 |
| 44 000 46 000 48 000 | 2,347 | 4,918 5,388 | 1754 500 | 55 548 |
| 20.000 | 2,680 | 5,882 | 1866 800 | 55,418 |
| 52,000 | 3,044 | 6.400 | 1984,500 | 54,325 |
| 54,000 | 3,441 | 6,944 | 2108 300 | 53 155 |
| 56,000 | 3,876 | 7,511 | 2238,300 | 51,751 |
| 58,000 | 4,353 | 8,100 | 2374,700 | 50,171 |
| 60.000 | 4.876 | 8,711 | 2517 700 | |
| 62.000 | 5.450 | 9.340 | 2517,700 2667,700 | 48,463 |
| 64,000 | 6,079 | 9.987 | 2667,700 | 46,663 |
| 66 000 | 6.766 | | 2824,700 | 44.797 |
| 68 000 | 7 517 | 10.650 | 2989 000 | 42 884 |
| 68 000 70 000 | 7,517 8,333 | 11,320 | 3160 700 | 40,933 |
| 72 000 | 0,333 | 11,326 12,012 12,707 13,407 14,108 | 3340°000 3526°900 | 40 ⁹ 33 38 ⁹⁵ 1 |
| 72 000 74 000 76 000 | 9 221 10 182 11 222 | 12, 101 | 3720,700 | 36,941 34,905 32,842 |
| 76 000 | 10,185 | 15,407 | 3121 300 | 34,905 |
| 70 000 | 13,626 | 14,108 | 3924_000 | 32,842 |
| 78.000 | 12.343 | 14+900 | 4134.200 | 30.152 |
| 80.000 | 13.549 | 15•498 | 4352.200 | 28.631 |
| 82.000 | 14.845 | 16•177 | 4576.000 | 26.478 |
| 84.000 | 16.232 | 16.840 | 4811.700 | 24.291 |
| | | | | |

TABLE 31. (CONT'D)

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| | 1. | ADDE 31. (C | UNT'D) | |
|---------------------------|--|--|----------------------|--------------------------------------|
| TIME | RANGE | | ŕ | |
| FROM | FROM | | | |
| LAUNCH | LAUNCH | ALTITUDE | VELOCITY | PATH |
| (SEC) | (NMI) | (NMI) | | ANGLE |
| 86.000 | 17.715 | 17:478 | (FT/SEC) | (DEG) |
| 88.000 | 19 206 | 16.087 | 5053.200 | 22.070 |
| 90,000 | 20 978 | | 5302,500 | 19,809 |
| 92,000 | 22 763 | 18,659 | 5559 800 | 17,513 |
| 94 000 | 24 653 | 19,186 | 5825°700 6101°400 | 15,187 |
| 96]000 | 20.978 22.763 24.653 26.650 28.756 30.973 33.305 35.755 | 19,661 | 6388 200 | `?ູ844 |
| 98 000 | 28 756 | 20,076 | 6400 200 | 10 000 |
| 100,000 | 30 973 | 20,425 | 6688 300 | 8,175 |
| 102,000 | 33 305 | 20,700 | 7004 300 | 5 884 |
| 104,000 | 35.755 | 20,896 | 7340 100 | 3,655 |
| 105,000 | 38 330 | 21.007 | 7698 300 | 1,512 |
| 108 000 | 41.041 | 21.032 | 8096,400 | -,288 |
| 110,000 | 43 904 | 20.987 | 8543 300 | -1.463 |
| 112,000 | 46 927 | 20,898 | 9026 500 | -1,987 |
| 114,000 | 43 904 46 927 50 219 | 20,783 | 9536,400 | -1 987 -2 329 |
| 116 000 | 53 603 | 20,642 | 10074 800 | 2 6/7 |
| 118 000 | 53 6n3 57 181 | 20,473 | 10645 700 | -5,803 |
| 120,000 | 60.960 | 20,299 | 11250 500 | _3 _068 |
| 122 000 | 64 957 | 20.078 | 11895 000 | -3,327 |
| 124.000 | 69.186 | 19,838 | 12583 600 | -2 803 -3 068 -3 327 -3 556 |
| | 0.4100 | 19.566 | 13372,600 | _3.766 |
| BURN-OUT | OF STAGE | 1 AT | | |
| 125.400 | 72.276 | 19.358 | 13608.000 | 3 000 |
| | _ | 170300 | 12000.000 | -3,903 |
| 126.000 | 73.608 | 10.044 | | |
| 128,000 | 78.015 | 19.266 | 13569,600 | -3.961 |
| 130,000 | 82.372 | 18,951 | 13423,500 | -4.157 |
| 132,000 | 86 675 | 18,625 18,288 17,939 17,581 17,212 | 13266 900 | -4.357 |
| 134 000 | 90.921 | 17,200 | 13096,600 | -4,562 |
| 136,000 | 95,104 | 17,939 | 12917,600 | -4,/71 |
| 138,000 | 99,220 | 17,301 | 12722 400 | -4 985 |
| 140.000 | 103 264 | 14 634 | 12511 500 | -5,204 |
| 142.000 | 103.264 107.229 | 10,034 | 12282 800 | -5,430 |
| 144.000 | 111,110 | 16.447 | 12037,400 | -5,663 |
| 146,000 | 114,901 | 16.052 | 11774.300 | -5.904 |
| 148,000 | 118,596 | 15,650 | 11492,700 | -6,153 |
| 150,000 | 122 189 | 15,241 | 11191 600 | -6,412 |
| 152,000 | 125 671 | 14.828 14.409 | 10870,700 | -6 681 |
| 154.000 | 129 038 | 17 407 | 10525 800 | -6,462 |
| 120,000 | 122 189 125 671 129 038 132 283 | 13.988 13.564 13.140 12.716 12.294 | 10169 000 | -7.257 |
| 158,000 | 1.922 9000 | 13 140 | 9789 300 | -7 566 |
| 100,000 | 138 381 | 13,140 | 9390 100 | _7_892 |
| 162,000 | 138 381 141 221 | 12 204 | 8971 200 8535 300 | _8 237 |
| 164.000 | 143.915 | 11.876 | 8085 . 500 | _8 604 _8 994 |
| - * v w | | 11000 | 0002•200 | "B. 994 |

TABLE 31. (CONT'D)

| 7 7 4 1 6 | | • | / | |
|---|-------------------------------|--|---|--------------------------------------|
| IIME | RANGE | | | |
| FROM | FROM | | | PATH |
| LAURTY | LAUNCH | ALTITUDE | VELUCITY | ANGLE |
| (SEC) | (NMI) | (NMI) | (FT/SEC) | (DEG) |
| 166.000 | 146,459 | 11.462 | 7625.690 | -9:412 |
| 168,000 | 148,851 | 11.055 | 7160.500 | |
| 1/0 000 | 151 089 | 10 655 | 000.001 00H APAA | -9.561 |
| 172 000 | 151 089 153 174 | 10 264 | 6694 800 6234 700 | _10_345 _10_868 |
| 170 000 172 000 174 000 | 155 109 | 10 264 9 882 | 5785 200 | 10 008 |
| 1,0,000 | 156 RGR | 9 500 | | _11 434 |
| 1/8 000 | 158 545 | 9.509 9.147 | 5349 760 | 12.050 12.720 |
| 180 000 | 158 545 160 058 161 441 | 9 704 | 4930 700 | -15.150 |
| 182,000 | 161 441 | 8,794 | 4530 500 | _13_450 |
| 104 000 | 162,701 | 8 453 8 122 | 4149 300 | _14_249 |
| 186 000 | 163 846 | | 3790 400 | _15_123 |
| 188 000 | 164 BR5 | 7 [*] 802 7 [*] 492 | 3456 000 | 13 450 14 249 15 123 16 081 |
| 186 000 188 000 190 000 | 165 825 | 7.191 | 3146 900 | _1/ 150 |
| 192,000 | 166,473 | (171 | 2862,600 | 18 280 |
| 194,000 | 167 437 | 6,901 | 2600,400 | -19,540 |
| 196.000 | 167,437 | 6,619 6,346 | 2359,400 | -20 918 |
| 198 000 | 168,123 | 6,346 | 2359,400 2139,700 | -22,427 |
| 200.000 | 168,739 | 5,081 | 1939,400 | _24_074 |
| 202.000 | 169,289 | 5.825 | 1/60_300 | -25,869 |
| 204 AAA | 169.782 | 5.575 | 1604,500 | -27,813 |
| 206.000 208.000 210.000 212.000 214.000 216.000 218.000 | 170,224 | 5,332 | 145! / / / / / / | -29,904 |
| 208 000 | 170.620 | 5,094 | 1347 100 1243 300 1153 800 1080 500 1027 400 | _32 140 |
| 210,000 | 170,975 | 4.860 | 1243 300 | _34_509 |
| 212 000 | 171,295 | 4,630 | 1153 800 | _36 996 |
| 214 000 | 171,583 | 4.402 | 1080 500 | _36 996 _39 579 |
| 214,000 | 171.844 | 4 175 | 1027 400 | 42 216 |
| 510,000 | 172,084 | 3,947 | 989 200 961 800 | .44.859 |
| 518,000 | 172,306 | 3,716 | 961 800 | 47 469 |
| 220,000 | 172,512 | 3 490 3 241 | 941 900 | 50 015 |
| 222,000 | 172,705 | 3,241 | 927 300 | 52.477 |
| 220 000 222 000 224 000 | 172,884 | 2,996 | 916 400 | 54 840 |
| 220,000 | 173,052 | 2 996 2 747 | 916 400 908 200 901 800 | _54 840 _57 095 |
| 220 ₂ 000 | 173,209 | 2,494 | 901 800 | 50 227 |
| 232,000 | 173,356 | 2,237 | 896 600 | -59 237 |
| 535 000 | 173,493 | 1.977 | | -61 266 |
| 234,000 | 173,621 | 1 713 | 888 500 | 63 182 |
| 236 000 | 173.740 | 1.713 1.447 | 885 000 | _64 987 |
| 234 000 236 000 238 000 240 000 242 000 | 173,851 | 1.178 | 892 300 888 500 885 000 881 600 878 400 874 700 869 300 862 200 859 533 | _66 684 _68 279 |
| 240,000 | 173,955 | 908 | 978 4AA | -00,219 |
| 242,000 | 174.051 | .636 | 974 700 | -07,116 |
| < | 174,141 | .363 | 0/7 /00 | -71 178 |
| 246,000 | 174,224 | .091 | 007,300 | -72,494 |
| 246,667 | 174.250 | 0 000 | 002.200 | _73 729 |
| • • • • | 4 · 7 • 6 3 U | 0.000 | ととて、マロス | -74 .123 |